

# Appendix E - CV's of Project Team

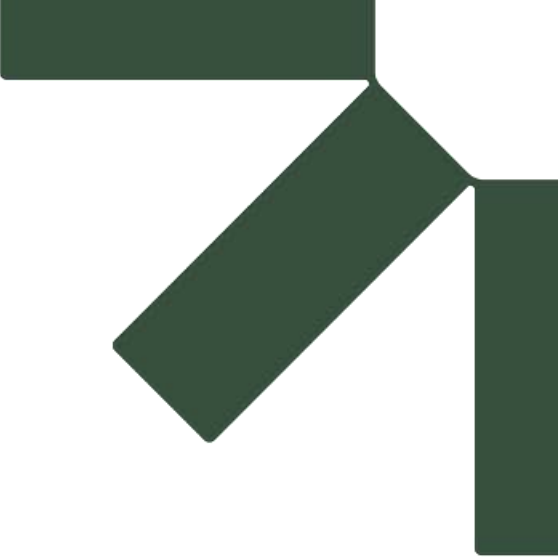


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# Appendix E Curriculum Vitae of Project Team

**Environmental and Social Impact Assessment for  
the proposed Vaccine Manufacturing Facility**

**The Biologicals and Vaccine Institute of Southern Africa (Pty)  
Ltd**

SLR Project No.: 723.000201.00001



## **Environmental and Social Impact Assessment Project Team**





Lebogang is an Environmental and Social Consultant within the Planning and Assessment team at SLR Consulting, leveraging her Honours degree in Environmental Studies and Geography from Stellenbosch University. She has contributed to projects across diverse sectors, including Mining, Oil and Gas, Renewable Energy, and Infrastructure. Lebogang is a highly capable environmental professional with expertise in project management, Environmental and Social Impact Assessments (ESIAs), stakeholder engagement, and ensuring robust environmental compliance and monitoring.

## Education

- BA (Hons) (Environmental Studies & Geography), Stellenbosch University (2023)
- BSocSci (Anthropology, Environmental & Geographical Sciences), University of Cape Town (2022)

## Skills

- Project management
- Report writing and presentation skills
- Knowledge of lender environmental and social standards (International Finance Corporation, European Investment Bank and African Development Bank etc.)
- Stakeholder Engagement
- Fieldwork, site inspections and environmental auditing
- GIS software proficiency
- Data collection, management and interpretation

## Project Experience

### Infrastructure

**Client:** The Biological Institute of Southern Africa (Pty) Ltd

**Project:** Biovac ESMP Audits (Current)

SLR was appointed by The Biological Institute of Southern Africa (Pty) Ltd to audit the Environmental and Social Management Plan (ESMP) in accordance with the requirements of the International Finance Corporation (IFC), the European Investment Bank (EIB) and the African Development Bank (AfDB) for the proposed vaccine manufacturing facility and associated infrastructure. Lebogang serves as the Project Manager for this project, coordinating engagement with the client, relevant stakeholders, and the multidisciplinary specialist team to ensure that the scope of work and all deliverables are executed in full compliance with the applicable lender standards.

**Client:** The Biological Institute of Southern Africa (Pty) Ltd

**Project:** Biovac ESIA and ESMP (Current)

SLR was by The Biological Institute of Southern Africa (Pty) Ltd to undertake an Environmental and Social Impact Assessment (ESIA) and develop an ESMP in accordance with the requirements of the IFC, EIB and the AfDB for the proposed vaccine manufacturing facility and associated infrastructure. Lebogang serves as the Project Manager for this project, coordinating engagement with the client, IFC, EIB and AfDB environmental and social representatives, relevant stakeholders, and the multidisciplinary specialist team to ensure that the scope of work and all deliverables are executed in full compliance with the applicable lender standards.

**Client:** Wesco Waste Management Facility (Pty) Ltd

**Project:** Environmental and Social Impact Assessment process for the proposed Wesco Waste Management Facility (Current)

SLR was appointed by Wesco Waste Management Facility (Pty) Ltd to undertake the Scoping and EIA (Environmental Impact Assessment) process, as well as the Water Use Licence Application (WULA), for a new integrated waste management facility in the Western Cape. As a key member of the project team, Lebogang's responsibilities for this ongoing ESIA include leading the preparation of assessment reports, liaising with the competent authorities, and coordinating comprehensive stakeholder engagement.

**Client:** AVIS Budget South Africa

**Project:** Operational Environmental Management Programme (EMPr) and Auditing (2025)

SLR was appointed by AVIS Budget South Africa (AVIS) to conduct an annual internal audit of underground storage tanks (USTs) for petrol and diesel at AVIS depots nationwide. Lebogang undertook site inspections of the USTs and associated infrastructure, including refuelling areas, to assess compliance with key environmental requirements.

The review focused on documentation and record-keeping, spill prevention and control, emergency response and contingency planning, incident reporting, fire-risk safeguards, hazardous and solid waste management, water pollution prevention and wastewater controls, and environmental monitoring procedures. These findings informed the audit reports prepared by Lebogang and supported the development of the Operational Environmental Management Programme (OEMPr) for all AVIS depots.

**Client:** ERO Engineers and Western Cape Government Department of Infrastructure

**Project:** Rehabilitation of the MR533 between St Helena Bay and Stompneus Bay, West Coast, South Africa (2024-2025)

SLR was appointed to provide Environmental Control Officer (ECO) services for a road rehabilitation project in St Helena Bay on the West Coast of South Africa. As Project Manager, Lebogang liaised directly with the client to ensure the effective delivery of all environmental services. Her responsibilities included undertaking routine site compliance audits against the approved EMPr, participating in project progress meetings with the client and project team, and preparing and submitting monthly ECO reports that detailed site observations and confirmed environmental compliance throughout the project lifecycle.

## Maritime Logistics

**Client:** Trans Hex Supply Services

**Project:** Trans Hex Ship-to-Ship Transfer EMP (Current)

SLR has been appointed to prepare an Environmental Management Plan (EMP) and develop environmental awareness training materials for the Ship-to-Ship (STS) operations of

the Goodwind Vessel, in accordance with the newly promulgated Regulations for the Environmental Management of Offshore Ship-to-Ship Transfers in South Africa. Lebogang serves as the Project Manager for this project, responsible for liaising with the client and relevant coastal authorities and ensuring that the full project scope is delivered effectively and in compliance with regulatory requirements.

## Renewable Energy

**Client:** G7 Renewable Energies (Pty) Ltd

**Project:** Part 1 Amendment Process for the Karreebosch Wind Energy Facility located in the Northern Cape (Current)

SLR has been appointed to undertake a Part 1 Amendment Process for the route realignment of the 33 kV overhead powerline associated with the Karreebosch Wind Energy Facility. Lebogang is the Project Manager, responsible for managing the amendment application process, including project planning, programme and budget management, coordination of specialist inputs, stakeholder engagement, and preparation and submission of the required amendment documentation to the competent authority.

**Client:** Private Client

**Project:** Two Solar PV Facilities, located in Beaufort West, Western Cape (Current)

SLR has been appointed to undertake a Basic Assessment (BA) Process for two Solar PV facilities in Beaufort West, Western Cape. Lebogang acted as Project Manager, overseeing project planning, scheduling, and reporting, as well as managing the full BA process. This included coordinating the pre-application and application phases, stakeholder engagement, specialist studies, and the preparation and submission of Draft and Final BA Reports and EMPs.

**Client:** Bonsmara Solar PV (RF) (Pty) Ltd

**Project:** Bonsmara Solar PV Facility, near Kroonstad in the Free State Province (Current)

SLR has been appointed by Bonsmara Solar PV (RF) (Pty) Ltd to undertake the EMP and site layout finalisation for the proposed Solar Energy Facility (SEF) in accordance with the National Environmental Management Act (NEMA). Lebogang has played a critical role in this project by compiling the Final EMP for the SEF, as well as the associated Overhead Powerlines, Substation, and Switching Station EMPs.

**Client:** Maverick Energy Consulting

**Project:** Environmental and Social Screening for a proposed 19.5 MW Solar PV Plant in Robertson, Western Cape, South Africa (2025)

SLR Consulting was appointed by Maverick Energy Consulting to undertake an environmental and social sensitivity screening for a proposed solar PV site in Robertson. As Project Manager, Lebogang was responsible for leading the screening process, which aimed to identify potential environmental and social impacts, confirm the NEMA-listed activities triggered by the development, and determine whether an Environmental Authorisation would be required.

**Client:** Coega Green Ammonia (Pty) Ltd (CGA)

**Project:** Proposed Green Hydrogen and Ammonia Project in the Coega Special Economic Zone, Gqeberha, Eastern Cape, South Africa (2024-2025)

Coega Green Ammonia (Pty) Ltd is proposing the development and operation of a 1 400 MW green hydrogen electrolyser and associated ammonia production plant within Zone 7 of the Coega Special Economic Zone (SEZ) in Gqeberha. SLR has been appointed by CGA to facilitate the Scoping and EIA process for the proposed development. Lebogang played a

key role in reviewing specialist studies and ensuring that all recommended mitigation measures were accurately incorporated into the Draft EMPs for the facility. She also supported the public participation process by ensuring comprehensive and timely stakeholder engagement throughout the EIA process.

**Client:** GensisHexicon (Pty) Ltd

**Project:** Environmental and Social Screening for 3 Offshore Floating Wind Projects, South Africa, Confidential Client (2024).

SLR was appointed to conduct an Environmental and Social Screening Study for three proposed offshore floating wind farms along South Africa's east and west coasts. The primary deliverable was an Environmental Permitting Plan, including an EIA schedule, budget, and scopes of work for all required specialist studies. Lebogang's contributions included drafting the Stakeholder Engagement Plan and supporting the preparation of the overall permitting framework for the client.

## Oil and Gas

**Client:** Private Client

**Project:** ESIA for 2D and/or 3D Seismic Surveys and Exploration Drilling in Area 2 off the Coast of the East coast of South Africa (Current)

SLR has been appointed to facilitate the Scoping and EIA process in accordance with the EIA Regulations. Lebogang has been actively involved in managing the project budget and resourcing requirements and has contributed significantly to the stakeholder engagement process by supporting the coordination and execution of all related activities to ensure effective and compliant engagement throughout the ESIA process.

**Client:** Afro Energy (Pty) Ltd

**Project:** Environmental Impact Assessment Process for Exploration Activities in ER383 in the Free State and Mpumalanga Provinces, South Africa (2024-2025)

SLR was appointed as the independent Environmental Assessment Practitioner to undertake the Scoping and EIA process in compliance with NEMA and the EIA Regulations for exploration activities in ER383. Lebogang contributed to the preparation of the Draft EMP and played a key role in managing the public participation process for the proposed project.

**Client:** Rhino Oil and Gas Exploration South Africa (Pty) Ltd

### Projects:

- EIA for Proposed Exploration Right Activities in ER377 in the Kroonstad, Koppies, Lindley, Heilbron & Edenville Magisterial Districts, within the Free State Province, South Africa (2024);
- EIA for Proposed Exploration Right Activities in ER378 in the Bothaville, Hoopstad and Wesselbron Magisterial Districts, within the Free State Province (2024);
- EIA for Proposed Exploration Right Activities in ER379 in the Middleburg, Carolina, Bethal, Wakkerstroom, Ermelo and Amersfoort Magisterial Districts, within the Mpumalanga Province, Rhino Oil and Gas Exploration South Africa (2024).

SLR Consulting was appointed as the independent Environmental Assessment Practitioner to undertake the required environmental assessment and manage the public participation process. The application followed a Scoping and EIA process in accordance with the EIA Regulations. Lebogang contributed to the preparation of the Final Scoping Reports and liaised with the relevant authorities to ensure compliance with regulatory requirements.

**Client:** Anergis International Limited

**Projects:** Air Quality Monitoring for the Anergis / Sunbird Gas to Power Project (2024)

SLR was appointed to undertake baseline ambient air quality monitoring for the proposed Anergis/Sunbird Gas-to-Power Project on Strandfontein Farm, along the west coast of the Northern Cape. Lebogang conducted the fieldwork, collecting baseline air quality data to ensure that the client has robust information on existing environmental conditions and to verify that the proposed development would not adversely affect air quality for surrounding receptors and remains within regulatory specifications.

**Client:** Searcher Geodata UK Limited

**Projects:** Environmental Control Officer Monitoring for the Orange Basin Multi-Client 3D Marine Seismic Survey, West Coast, South Africa (2024)

SLR was appointed to provide ECO services for a 3D seismic survey off the West Coast of South Africa. Lebogang played a pivotal role in safeguarding environmental compliance throughout the project, ensuring that all activities adhered rigorously to the approved EMP. She expertly compiled detailed monthly ECO audit reports, highlighting both compliance and areas requiring corrective action, and compiled the final close-out report, verifying that the project was completed in full alignment with environmental authorisation conditions.

## Mining

**Client:** Trans Hex Operations

**Projects:** Environmental Impact Assessment and Environmental Management Programme for Marine Diamond Mining in 11A, 12A, 13A and corresponding Surf-Zone Concessions and Admiralty Strips (2025)

SLR was appointed by Trans Hex as the independent Environmental Assessment Practitioner to undertake the required update of the EMP in accordance with applicable regulatory requirements. Lebogang supported the compilation of the EMP and played an active role in facilitating stakeholder engagement throughout the process.



Nicholas has over 19 years' experience as an environmental assessment practitioner and has been responsible for undertaking environmental assessment processes for various projects relating to the power, mining, oil & gas, road infrastructure, built environment and industrial sectors.

For the last 8 years he has undertaken a number of environmental assessment applications for projects in the offshore environment which entailed extensive public participation processes and the last,

Nicholas has been involved in a number of projects in South Africa and has experience working in the Democratic Republic of Congo (DRC), Namibia, Zambia and Zimbabwe.

## Education

- BSc (Hons) Earth and Geographical Sciences (Environmental Management), University of Cape Town (2005)
- BSc Earth and Geographical Sciences and Zoology, University of Cape Town (2004)

## Project Experience

### Power

#### **South Africa Mainstream Renewable Power Developments (Pty) Ltd – Application to amend Environmental Authorisation for the Damlaagte and Ilikwa Photovoltaic Plants, Free State Province (2022)**

Applications to Amend Environmental Authorisation for the Damlaagte and Ilikwa Photovoltaic Plants, located in the Free State Province. Nicholas was the project manager and responsible for the compilation of amendment application and managed the appointed specialists.

#### **South Africa Mainstream Renewable Power Developments (Pty) Ltd – Proposed Scaffell Cluster Photovoltaic Plants, Free State Province (2021 - 2022)**

Four separate EIA processes for the proposed construction of Photovoltaic Plants with a combined generating capacity of up to 475 MW, located in the Free State Province. Nicholas was the project manager and responsible for the compilation of the Scoping and EIA Reports (including EMP) for all projects, undertaking the required public participation processes and management of the appointed specialists.

#### **SolarReserve South Africa (Pty) Ltd – Proposed Kalkaar CSP and Photovoltaic Plants, Free State (2014 -2015)**

EIA process for the proposed construction of a Concentrated Solar Thermal Plant (CSP) and a Photovoltaic Plant, located in the Free State Province. Nicholas was the project manager and compiled of the Scoping and EIA Reports (including EMP) for both projects, undertook the required public participation process and managed the appointed specialists.

### Mining and Minerals

#### **Trans Hex Operations (Pty) Ltd – Update of Environmental Management Programme for Marine Diamond Mining in 11A, 12A, 13A and Corresponding Surf-Zone Concessions and Admiralty Strips (Current)**

Update of existing Environmental Management Programme (EMP) for mining operations in 11A, 12A, 13A and corresponding surf-zone concessions and admiralty strips off the West Coast of South Africa.

Nicholas is the project manager and is responsible for the compilation of the updated EMPr and management of the appointed specialists.

**De Beers Marine (Pty) Ltd – Basic Assessment for a Prospecting Right in Sea Areas 4C and 5C, West Coast, South Africa (2021 - 2023)**

Basic Assessment process in support of a Prospecting Right application over Sea Areas 4C and 5C, off the West Coast of South Africa. Nicholas is the project manager and is responsible for the compilation of the Basic Assessment Report (BAR), undertaking of the required public participation process and management of the appointed specialists.

**Moonstone Diamond Marketing (Pty) Ltd – Prospecting Right Application in Sea Areas 11B and 13B, West Coast, South Africa (2022 - 2023)**

SLR was appointed to undertake the EIA phase of an application for Environmental Authorisation in support of Prospecting Right applications over Sea Areas 11B and 13B, off the West Coast of South Africa. The application was subsequently withdrawn before commencement of the public participation process. Nicholas was the project manager and is responsible for the compilation of the Environmental Impact Assessment Report and EMPr and management of the appointed specialists.

**Belton Park Trading 127 (Pty) Ltd – Prospecting Right application for Sea Concessions 13C, 15C, 16C, 17C & 18C, West Coast, South Africa (2020 -2022)**

Environmental Impact Assessment (EIA) process for the proposed offshore prospecting operations in Sea Concessions 13C, 15C, 16C, 17C and 18C, off the West Coast of South Africa. Nicholas was the project manager and is responsible for the compilation of the Scoping and Environmental Impact Reports, undertaking of the required public participation process and management of the appointed specialists.

**Belton Park Trading 127 (Pty) Ltd – Prospecting Right application for Sea Concessions 14B, 15B & 17B, West Coast, South Africa (2020 -2022)**

Environmental Impact Assessment (EIA) process for the proposed offshore prospecting operations in Sea Concessions 14B, 15B and 17B, off the West Coast of South Africa. Nicholas was the project manager and is responsible for the compilation of the Scoping and Environmental Impact Reports, undertaking of the required public participation process and management of the appointed specialists.

**De Beers Marine (Pty) Ltd – Environmental Impact Assessment for Bulk Sampling Activities for Offshore Marine Diamonds, West Coast, South Africa (2019 - 2022)**

EIA process for the proposed offshore Bulk Sampling operations in the Sea Concession 6C, off the West Coast of South Africa. Nicholas was the project manager and is responsible for the compilation of the Scoping and Environmental Impact Reports, undertaking of the required public participation process and management of the appointed specialists.

**Bilboes Holdings (Pvt) – Proposed Isabella, McCays and Bubi Sulphide Gold Project, Zimbabwe (2018 - 2020)**

Environmental and Social Impact Assessment (ESIA) for the proposed expansion of an existing gold mine complex located in Zimbabwe. Nicholas is the project assistant and compiled the Scoping Report, assisted with the undertaking of the required public participation process and management of the appointed specialists.

**Zevocept (Pty) Ltd – Development of a borrow pit, Western Cape, South Africa (2019 - 2020)**

Basic Assessment process for the proposed development of a borrow pit on Farm Modder Rivier, Western Cape. Nicholas assisted in the compilation of the BAR, overseeing the required public participation process and the management of the appointed specialists.

**De Beers Marine (Pty) Ltd – Pre-Scope Environmental Input for Offshore Geophysical Survey, Greenland (2019)**

Undertake an initial evaluation of the anticipated impacts associated with planned geophysical surveys to be undertaken off the west coast of Greenland and compile environmental input to be included into a Pre-Scope submission to the Greenland Minerals Authority. Nicholas undertook the management of the appointed specialists.

**Copper Tree Minerals – Proposed Kitwe Tailings Retreatment Project, Zambia (2017 - 2019)**

ESIA for the proposed retreatment of historical tailings dumps located within the town of Kitwe, Zambia. Nicholas is the project manager for the ESIA phase and is responsible for the compilation of the ESIA Report, undertaking of the required public participation process and management of the appointed specialists.

**De Beers Marine (Pty) Ltd – Prospecting Right application for offshore marine Diamonds in Sea Concession 6C, West Coast, South Africa (2018)**

Basic Assessment process for the proposed offshore prospecting operations in the Sea Concession 6C, off the West Coast of South Africa. Nicholas compiled the Basic Assessment Report (including EMP), undertook the required public participation process and managed the appointed specialists.

**Velddrift Salt Company (Pty) Ltd –Salt mine, Velddrift, South Africa (2018)**

Update the Financial Provision for the salt mine on Portion 69 of Farm 110 near Velddrift, Western Cape, South Africa. Nicholas undertook the update of the existing financial provision and prepared the assessment report.

**Impala Platinum Limited Unincorporated Joint Venture – EMP Performance Assessment and Closure Liability Estimate for Prospecting Operations (2017)**

EMP Performance Assessment and Closure Liability Estimate for the Klipgatkop 115-JQ prospecting operations. Nicholas was the project manager and compiled the EMP Performance Assessment and Closure Liability Estimate reports.

**Belton Park Trading 127 (Pty) Ltd – Mining Right application for offshore marine Diamonds in Sea Concession 2C, West Coast, South Africa (2016 - 2017)**

EIA process for the proposed offshore mining of marine diamonds in the Sea Concession 2C, off the West Coast of South Africa. Nicholas compiled the Scoping and EIA Reports (including EMP), undertook the required public participation process and managed the appointed specialists.

**Belton Park Trading 127 (Pty) Ltd – Marine Sediment Sampling Activities in Sea Concessions 2C – 5C, West Coast (2014 - 2015)**

Basic Assessment process for the proposed drill and bulk sampling of marine sediments in Sea Concessions 2C, 3C, 4C and 5C, off the West Coast of South Africa. Nicholas compiled the BAR (including EMP), undertook the required public participation process and managed the appointed specialists.

**Aquarius Platinum (SA) (Pty) Ltd – Prospecting rights application on the Farms Chieftains Plain 46-JT and Walhalla 1-JT (2014)**

Environmental Management Programme (EMP) for the proposed prospecting activities to be undertaken on the Farm Chieftains Plain 46-JT and Walhalla 1-JT. Nicholas was the project manager and compiled the EMP for both projects. 2014 Project management of application.

**Aquarius Platinum (SA) (Pty) Ltd – Proposed Extension of the K5 Upper Underground Mining Area (2014)**

EIA amendment process for the existing K5 Upper Mining Right to provide for the extension of the K5 Upper underground mining area. Based on the strong public reaction to the project, AQPSA took the decision to place the project on hold. Nicholas was the project manager and undertook the initial public participation process.

**Banro Corporation - Proposed Namoya Gold Mining Project, Maniema, DRC (2013)**

ESIA for the proposed construction of a greenfield gold mine located in the DRC. Nicholas was the project manager and compiled the ESIA Report (including EMP), undertook the required public participation process and managed the appointed specialists.

**Aquarius Platinum (SA) (Pty) Ltd – Kroondal and Marikana EMP Consolidation (2013 - 2015)**

Consolidation of the existing approved EMPs for the Kroondal and Marikana Platinum Mines, located in the North West Province. Nicholas was the project manager and compiled of the Consolidated EIA Report (including EMP) for each operation and managed the appointed specialists.

**Aquarius Platinum (SA) (Pty) Ltd – WULA for the proposed extension of Everest Platinum Mine (2011 - 2012)**

Water Use License Application (WULA) process for the proposed expansion of the Everest Platinum Mine, located in Mpumalanga. Nicholas assisted in the compilation of the necessary WULA documentation, including the Integrated Water and Waste Management Plan (IWWMP) for the project.

**Aquarius Platinum (SA) (Pty) Ltd – Proposed Extension of Everest Platinum Mine (2011 - 2012)**

EIA process for the proposed expansion of the Everest Platinum Mine, located in Mpumalanga. Nicholas was the project manager and compiled of the Scoping and EIA Reports (including EMP), undertook the required public participation process and managed the appointed specialists.

**Afplats (Pty) Ltd – EMP Performance Assessment for Prospecting Operations (2011)**

EMP Performance Assessment for the Wolwekraal 408-JQ and Kareepoort 407-JQ prospecting operations. Nicholas was the project manager and compiled the EMP Performance Assessment reports.

**Aquarius Platinum (SA) (Pty) Ltd – Re-assessment of the Financial Provision for Closure for Everest Platinum Mine (2011)**

Annual re-assessment of the closure cost estimate for the Everest Platinum Mine. Nicholas was the project manager and compiled the annual review of the mines Financial Provision for Closure for 2011.

**Leeuw Mining and Exploration (Pty) Ltd – Proposed Underground Coal Mine (2011)**

EIA process for the proposed underground coal mine located near Utrecht, Kwa-Zulu Natal. Nicholas was the project manager and compiled of the Scoping and EIA Report (including EMP), undertook the required public participation process and managed the appointed specialists.

## **Oil and Gas**

**Total E&P South Africa B.V. - Proposed Well-Drilling Activities in a Southern Area of Interest in Block Deep Western Orange Basin off the West Coast of South Africa (current)**

EIA process for the proposed offshore exploration well drilling in a southern Area of Interest of the Block Deep Western Orange Basin, West Coast of South Africa. Nicholas is providing technical input to the project team for the EIA Process and is responsible for review of the Scoping and EIA Reports (including EMP).

**Searcher Geodata UK Limited – Environmental Control Officer Monitoring for the Orange Basin Multi-Client 3D Marine Seismic Survey, West Coast, South Africa (2024)**

SLR was appointed to provide ECO services for a 3D seismic survey off the West Coast of South Africa. Nicholas served as the Lead ECO during the seismic survey and was responsible for compiling monthly ECO audit reports.

**Harmattan Energy Ltd., a Chevron affiliate - Proposed Well-Drilling in Licence Block 2813B, Orange Basin, off the coast of southern Namibia (2023 - 2024)**

EIA process for the proposed offshore exploration well drilling in the Block 2813B, offshore Namibia. Nicholas is the project manager for the EIA Process and is responsible for compiling the Scoping and EIA Reports (including EMP), undertaking the required public participation process and managing the appointed specialists.

**Total E&P South Africa B.V. - Proposed Well-Drilling and Additional Exploration Activities in Block Deep Western Orange Basin off the West Coast of South Africa (2022 - 2023)**

EIA process for the proposed offshore exploration activities in the Block Deep Western Orange Basin, West Coast of South Africa. Nicholas was the project manager for the EIA Process and responsible for compiling the Scoping and EIA Reports (including EMP), undertaking the required public participation process and managing the appointed specialists.

**Rhino Oil & Gas Exploration South Africa (Pty) Ltd – EIA for exploration well drilling in 318ER, Free State, South Africa (2023)**

EIA process for the proposed exploration well-drilling activities in ER318, Free State, South Africa. Nicholas is the project manager for the Scoping Phase of the EIA Process and is responsible for compiling the Scoping Report and undertaking the required public participation process.

**Total E&P South Africa B.V. - Proposed Exploration well drilling in Block 5/6/7, offshore South-West Coast, South Africa (2021 – 2023)**

EIA process for the proposed offshore exploration activities in the Block 5/6/7 off the South-West Coast of South Africa. Nicholas provided project support for the EIA Process and public participation process.

**ION Geophysical Corporation – Basic Assessment for a proposed 3D Seismic Survey, West Coast, South Africa (2022)**

Basic Assessment process in support of a Reconnaissance Permit Application for a 3D seismic survey off the West Coast of South Africa. Nicholas is the project manager for the Basic Assessment process and is responsible for compiling the BAR (including EMP), undertaking the required public participation process and managing the appointed specialists.

**Rhino Oil & Gas Exploration South Africa (Pty) Ltd - Performance Assessment for Renewal of Exploration Right No. 294, Free State Province (2022)**

EMP Performance Assessment of exploration activities in support of an Exploration Right Renewal Application over various farms in the Free State Province (Exploration Right No. 294). Nicholas was the project manager and compiled the EMP Performance Assessment report.

**Rhino Oil & Gas Exploration South Africa (Pty) Ltd - Performance Assessment for Renewal of Exploration Right No. 318, Free State Province (2022)**

EMP Performance Assessment of exploration activities in support of an Exploration Right Renewal Application over various farms in the Free State Province (Exploration Right No. 318). Nicholas was the project manager and compiled the EMP Performance Assessment report.

**Searcher Geodata UK Limited – Reconnaissance Permit Application for 2D and 3D seismic surveys off the West and South-West Coast South Africa (2021)**

EMP process for the proposal to undertake 2D and 3D speculative seismic surveys offshore of the West and South-West Coasts, South Africa. Nicholas was the project assistant and provided input into the EMP report, facilitated the required public participation process and managed the appointed specialists.

**New Age Energy Algoa (Pty) Ltd – Environmental Audit Algoa-Gamtoos Block, East Coast of South Africa (2020)**

Environmental Audit undertaken in compliance with Section 54 (A)(2) of the EIA Regulations, 2014 (as amended) for the exploration activities conducted in the Algoa-Gamtoos Block. Nicholas was the project manager and responsible for undertaking the required audit and compiling the audit report.

**PGS Exploration (UK) Limited – Reconnaissance Permit Application for 2D and 3D seismic surveys offshore West Coast South Africa (2018)**

EMP process for the proposal to undertake 2D and 3D speculative seismic surveys offshore of the West Coast, South Africa. Nicholas was the project manager and compiled the EMP report, undertook the required public participation process and managed the appointed specialists.

**PGS Exploration (UK) Ltd – 2D and 3D seismic surveys compliance, South and East Coasts, South Africa (2015-2016)**

EMP Compliance and audit services for speculative 2D and 3D seismic surveys off the South and East Coasts of South Africa. Nicholas' role included managing the audit process and compiling the survey close-out reports, which outlined the implementation of the EMP (compliance) and highlighted any problems and non-compliance issues that arose during each survey.

**PGS Exploration (UK) Limited – Reconnaissance Permit Application Amendment to undertake a 3D seismic survey offshore KwaZulu-Natal, South Africa (2018)**

EMP Amendment process for the proposal to undertake a 3D speculative seismic survey offshore of KwaZulu-Natal, South Africa. Nicholas was the project manager and compiled the Amended EMP report, undertook the required public participation process and managed the appointed specialists.

**PGS Exploration (UK) Limited – Reconnaissance Permit Application to undertake 2D and 3D seismic surveys, South Africa (2017)**

EMP process for a Reconnaissance Permit Application to undertake 2D and 3D speculative seismic surveys of the East Coast, South Africa. Nicholas was the project manager and compiled the EMP report, undertook the required public participation process and managed the appointed specialists.

**Rhino Oil & Gas Exploration South Africa (Pty) Ltd – Proposed Exploration Activities in offshore Licence Blocks 3617 and 3717, South-West coast of South Africa (2015 -2016)**

EIA process for the proposed offshore exploration activities in Licence Blocks 3617 and 3717, South-West coast of South Africa. Nicholas assisted in the compilation of the Scoping and EIA Reports (including EMP), undertook the required public participation process and managed the appointed specialists.

**Rhino Oil & Gas Exploration South Africa (Pty) Ltd – Proposed Exploration Activities in Various Inshore Licence Blocks, South-West coast of South Africa (2015 -2016)**

EIA process for the proposed exploration activities in various inshore Licence Blocks, South-West coast of South Africa. Nicholas assisted in the compilation of the Scoping and EIA Reports (including EMP), undertook the required public participation process and managed the appointed specialists.

**Total E & P (SA) (Pty) Ltd - Proposed bathymetry survey and seabed sediment sampling in Block 11B/12B (2014 -2015)**

EMP Addendum for an application to undertake sonar surveys and seabed sediment sampling as part of the approved exploration programme for License Block 11B/12B. Nicholas was the project manager and compiled the EMP report, undertook the required public participation process and managed the appointed specialists.

## **Infrastructure – Roads**

**AECOM SA for Western Cape Government (WCG): Department of Transport & Public Works - Upgrading of TR31/2 between Ashton and Montagu (2018 - 2019)**

ECO services for the upgrading of Trunk Road 31 Section 2, Cogmanskloof Pass, between Ashton and Montagu, including the main roads through the two towns. Nicholas served as the ECO during the interim contract phase and provided monthly ECO audit reports.

**GIBB (Pty) Ltd for WCG:DTPW – Construction of Erosion Protection Measures for the Swart River Bridge, South Africa (2016 - 2017)**

Basic Assessment process for the proposed implementation of erosion protection measures along a section of the Swart River which is traversed by the TR 34, approximately 7 km north of Prince Albert. Nicholas was the project manager and compiled the Basic Assessment Report (BAR), undertook the required public participation process and managed the appointed specialist.

**SMEC SA (Pty) Ltd for South African National Roads Agency SOC Ltd (SANRAL) - Proposed establishment of a Quarry, Eastern Cape (2016 - 2018)**

EIA process for the proposed development of a quarry for the extraction of material for the construction of the Mthentu and Msikaba Bridges for the N2 Wild Coast Toll Highway. Nicholas compiled the Scoping and EIA Reports (including EMP), and project managed the required public participation process.

**Hatch Goba (Pty) Ltd for WCG:DTPW- Maintenance Management Plan for flood damage repair of structures in the Ladismith West area (2016 - 2017)**

Maintenance Management Plan (MMP) for the proposed repairs to road infrastructure at fourteen different sites that were damaged during flood events in the Ladismith West area situated between Ladismith and Montagu. Nicholas was the project manager and compiled the MMP, undertook the required public participation process and managed the appointed specialist.

**ERO Engineers (Pty) Ltd for WCG:DTPW - Proposed Repair and Reseal of Main Road (MR) 233 to Langebaan (2015)**

MMP for the proposed rehabilitation works of the MR 233 between the R 27 (km 6.80) and north of Langebaan (km 12.84). Nicholas was the project manager and compiled the MMP, undertook the required public participation process and managed the appointed specialist.

**Ekurhuleni Metropolitan Municipality (Eastern Region) – Proposed Gauteng Road (P1894) (2007 - 2009)\*\***

EIA for the construction of a new road between Sam Smith Road (Tsakane) and Vlakfontein Road (Kwa-Thema), Ekurhuleni Metropolitan Municipality. Nicholas was the project manager and compiled the Scoping and EIA Report (including EMP), undertook the required public participation process and managed the appointed specialists.

**Infrastructure – Water and Wastewater**

**Meerenhof Properties (Pty) Ltd - Expansion of dams, South Africa (2017 – 2022)**

Construction and expansion of irrigation dams on Uitsig Farm, Constantia, Cape Town. Nicholas is fulfilling the role of ECO and provides monthly ECO audit reports.

**Saldanha Bay Municipality - Maintenance Management Plans for the Bok and Mosselbank Rivers (2016 - 2017)**

MMP for the proposed maintenance activities to be undertaken within the Bok and Mosselbank Rivers. Nicholas was the project manager, compiled the MMPs and undertook the required public participation process.

**BVI Consulting Engineers WC (Pty) Ltd for the City of Cape Town: Transport for Cape Town – Proposed upgrade of the Bayside Canal (2015 - 2020)**

Basic Assessment process for the upgrade of the Bayside Canal Outfall System located in Tableview, Cape Town. Nicholas is the project manager and is responsible for compiling the BAR, undertaking the required public participation process and managing the appointed specialists.

**BVI Consulting Engineers WC (Pty) Ltd for the City of Cape Town: Transport for Cape Town – Proposed stormwater pipeline linking Sunningdale to the Big Bay stormwater outfall pipeline (2015 - 2016)**

Basic Assessment process for the construction of a new stormwater pipeline to route runoff from Sunningdale Phases 12A, 13 and 14 to the existing Big Bay Outfall pipeline located at the eastern boundary of the suburb of Big Bay. Nicholas was the project manager and compiled the BAR, undertook the required public participation process and managed the appointed specialists.

**Arup - Proposed Sandspruit Rehabilitation for Stormwater Management of Melrose Arch, Sandton (2010)\*\***

Basic Assessment for the rehabilitation of the Sandspruit to facilitate the management of stormwater runoff emanating from the Melrose Arch precinct. Nicholas was the project manager and compiled the BAR (including EMP), undertook the required public participation process and managed the appointed specialists.

## **Infrastructure – Solid Waste**

### **Wesco Waste Management Facility (Pty) Ltd – ESIA for the proposed Wesco Waste Management Facility, Western Cape (Current)**

ESIA for the construction of a new integrated waste management facility in the Western Cape. Nicholas is the project manager and will be responsible for compiling the Scoping and ESIA Report (including EMP), undertaking the required public participation process and managing the appointed specialists.

### **Energy Omega Oils (Pty) Ltd – Audit of Blackheath Waste Storage Facility (2017)**

External audit of the Blackheath Waste Storage Facility in terms of the National Norms and Standards for the Storage of Waste (Government Notice No. 926 of 29 November 2013). Nicholas undertook and compiled the audit report.

### **Impala Platinum (Pty) Ltd - Proposed Central Salvage Yard (2011 - 2012)**

Basic Assessment process and Waste Management License application for the proposed construction of a salvage yard, and associated activities, located at Impala Platinum's Rustenburg operations. Nicholas compiled the BAR (including EMP), undertook the required public participation and waste management license application processes and managed the appointed specialists.

## **Built Environment**

### **Proposed establishment of a fuel station on Erf 38333, Milnerton, Cape Town, Richmond Park Development Company (Pty) Ltd (2019 - 2022)**

Basic Assessment for the establishment of a fuel station on Erf 38333, Milnerton, Cape Town. Nicholas was the project manager and compiled the BAR (including EMP), undertook the required public participation process and managed the appointed specialists.

### **Construction of a warehouse, Brackenfell, We Buy Cars Properties (Pty) Ltd (2019)**

ECO services for the construction of the We Buy Cars warehouse in Brackefell, Western Cape. Nicholas acted as the project manager and was responsible for reviewing the monthly ECO reports

### **Luna Country Club Holdings - Proposed Subdivision of Erf 177476, St James (2017 – 2021)**

Basic Assessment process for the subdivision of Erf 177476 into five separate portions with the intent to sell four of the subdivided portions to third-parties for residential use. Nicholas is the project manager and is responsible for compiling the BAR, undertaking the required public participation process and managing the appointed specialists.

### **Mountain View Estate Shareblock Company Limited - Proposed Mountain View Estate (2009 - 2010) \*\***

EIA for a residential and aviation estate on the Farm Simonsview 490-JQ, and various portions of the Farms Kalkheuwel 493-JQ, Rhenosterspruit 495-JQ and Riverside 497-JQ, Gauteng and North West Province. Nicholas was the project manager and compiled of the Scoping and EIA Report (including EMP), undertook the required public participation process and managed the appointed specialists.

### **Lead Wood Development Company (Pty) Ltd - Proposed Leadwood Nature Estate (2008) \*\***

EIA for a residential and game estate on the Remainder of Portion 2 of The Farm Happyland 241-KT, Hoedspruit, Limpopo. Nicholas was the project manager and compiled of the Scoping and EIA Report (including EMP), undertook the required public participation process and managed the appointed specialists.

### **Hayes Matkovich Developments (Pty) Ltd – Proposed Standerton Country Estate (2008) \*\***

EIA for a golf estate on the Portions of the Farms Grootverlangen 409-IS and Langerwyl 410-IS, Standerton, Mpumalanga. Nicholas was the project manager and compiled of the Scoping and EIA Report (including EMP), undertook the required public participation process and managed the appointed specialists.

**Sugar Creek Trading 33 (Pty) Ltd - Proposed Development of Zandspruit Estate (2007 -2008) \*\***

EIA for a residential, game and aviation estate on the Remainder of The Farm Happyland 241-KT, Hoedspruit, Limpopo. Nicholas was the project manager and compiled of the Scoping and EIA Report (including EMP), undertook the required public participation process and managed the appointed specialists.

**C.J.Irons CC - Taemane Residential Estate (2007) \*\***

Basic Assessment for the proposed residential estate located on a Part of the Remainder of Portion 52 of the Farm Garstfontein 374-JR, Pretoria, Gauteng. Nicholas was the project manager and compiled the BAR (including EMP), undertook the required public participation process and managed the appointed specialists.

**Riverspray Lifestyle Estate (Pty) Ltd - Proposed Riverspray Lifestyle Estate (2006) \*\***

EIA for a residential and lifestyle estate on bank of the Vaal River in Vanderbijlpark, Gauteng. Nicholas was the project manager and compiled of the Scoping and EIA Report (including EMP), undertook the required public participation process and managed the appointed specialists.

**Built Environment – Recreation**

**South African National Parks (SANParks) - Proposed Preekstoel Boardwalk Within the West Coast National Park (2009) \*\***

Basic Assessment for the establishment of boardwalks in the Preekstoel section of the West Coast National Park, (SANParks). Nicholas was the project manager and compiled the BAR (including EMP), undertook the required public participation process and managed the appointed specialists.

**SANParks - Construction of a Walkway and Suspension Bridges in the Tsitsikamma National Park (2008) \*\***

Basic Assessment for the establishment of a walkway and additional suspension bridges in the Tsitsikamma National Park, South Africa. Nicholas was the project manager and compiled the BAR (including EMP), undertook the required public participation process and managed the appointed specialists.

**Expansion of the Winterveld Cemetery, City of Tshwane Metropolitan Municipality (MM) (2007 - 2010) \*\***

Basic Assessment for the expansion of the existing Winterveld Cemetery located within the City of Tshwane Metropolitan Municipality. Nicholas was the project manager and compiled the BAR (including EMP), undertook the required public participation process and managed the appointed specialists.

**Expansion of the Klipkruisfontein Cemetery, City of Tshwane Metropolitan Municipality (MM) (2007 - 2010) \*\***

Basic Assessment for the expansion of the existing Klipkruisfontein Cemetery located within the City of Tshwane Metropolitan Municipality. Nicholas was the project manager and compiled the BAR (including EMP), undertook the required public participation process and managed the appointed specialists.

**Proposed Central Operations Centre (COC), Tolplan (Pty) Ltd for SANRAL (2009) \*\***

Basic Assessment for the proposed construction of the SANRAL COC Building. Nicholas was the project manager and compiled the BAR (including EMP), undertook the required public participation process and managed the appointed specialists.

**Erf5 Melrose Estate CC - Section 24G Rectification for a Roof Signboard (2008) \*\***

Rectification Application in terms of Section 24G (S24G) of the National Environmental Management Act, 1998 for the unlawful erection of a roof signboard on the corner of Juta and Eendracht Streets,

Johannesburg. Nicholas was the project manager and compiled the Rectification Application (including EMP) and undertook the required public participation process.

**Wideopen Leasing (Pty) Ltd – S24G Rectification for a Sky Sign, 78 Fox Street (2007) \*\***

Rectification Application in terms of S24G of the National Environmental Management Act, 1998 for the unlawful erection of a Sky Sign at 78 Fox Street, Johannesburg. Nicholas was the project manager and compiled the Rectification Application (including EMP) and undertook the required public participation process.

## Memberships and Associations

- EAPASA Registered Environmental Assessment Practitioner (Reg. No. 2019/1001)
- Registered as a Professional Natural Scientist - Environmental Scientist (Reg. No. 113939)
- Chairperson of Western Cape Branch Committee of the International Association for Impact Assessment – South Africa (IAIASa) (2021 – Current).

## Publications

- Good Practice Environmental Guideline for Marine Minerals Activities in the Benguela Current Large Marine Ecosystem. Rossouw, N. & Arnott, N. (Still in review)



Stuart has over 28 years of environmental and social consulting experience in Africa. Having worked on over 140 development projects in Africa, his key strength is identifying and managing ESG risks for major capital projects from the concept phase through to the pre-feasibility, feasibility and implementation phases.

Through leading Environmental & Social Screening Studies, Environmental & Social Impact Assessments and Environmental & Social Due Diligences for major capital project in over 13 African countries; Stuart has developed a deep appreciation of key sustainability challenges facing development in Africa. He has excellent project management skills with the ability to manage projects from the concept phase through to project completion.

Stuart has worked for and with several IFI's, DFI's and PE firms to identify and managing ESG risks of their investments in Africa. He has an integral knowledge of the Equator Principles and IFC Performance Standards and understands the expectations of lenders and financial institutions when it comes to managing ESG risks.

Stuart has worked across various sectors including O&G, mining, infrastructure and power. Over the past ten years he has focused on the power sector leading projects for wind farms, solar PV plants, hydropower plants and gas to power plants. More recently he has advised various clients on the regulatory challenges for green hydrogen projects in Southern Africa. For the past 13 years, Stuart has been involved in undertaking ESIA's and advising clients on environmental and social (E&S) risks for projects in the various REIPPPP rounds. Apart from this, he acted as E&S advisor to the IPP Office during the Department of Energy's Gas to Power Programme in South Africa in 2015 and led several of the Gas to Power and LNG import terminal ESIA's at the time. He again acted as an E&S advisor to several clients during the RMIPPPP in 2020. More recently Stuart has been focusing on Green Hydrogen Projects in both South Africa and Namibia. He is the Project Director for the ESIA's for the Hyphen Green Hydrogen Export Project in Namibia and the Hive Energy Green Hydrogen Export Project in the Eastern Cape, South Africa. Furthermore, he is advising on several other green hydrogen projects along the west coast of South Africa and is an active member of the GIZ funded programme: *H2/ PtX-Market Opportunities for South Africa: Analyses of Lighthouse-Projects and Environmental-Social Impact Assessment*.

## Education

- BSc (Hons) Civil Engineering, University of Cape Town (1992)
- MSc Environmental Science, University of Cape Town (1996)

## Professional Registration

- EAPASA- Registered Environmental Assessment Practitioner South Africa # 2019/613 (2019)
- EAPASA - Register Environmental Assessment Practitioner Namibia # 2022/240

## (2019) Countries worked in

South Africa, Eswatini, Lesotho, Namibia, Mozambique, Angola, Botswana, Zambia, Zimbabwe, DRC, Kenya, Tanzania, Malawi, Uganda, Ethiopia, Nigeria, Ghana, Liberia.

## Project Experience

**Member of the H2/ PtX-Market Opportunities for South Africa: Analyses of Lighthouse-Projects and Environmental-Social Impact Assessment, led by H2Global Advisory GmbH and CSIR, funded by GIZ (2023)**

**ESIA Advisory for a 1.5 GW Green Fuels Facility (Hydrogen/Ammonia/Methanol) facility along the West Coast, South Africa, Confidential Client (2023)**

E&S advisor for the establishment of a 1.5 GW greenfield green fuels project in Saldanha Bay on the West Coast of South Africa. The project components included generation, transmission, desalination and water pipelines, electrolysis and hydrogen storage, ammonia/methanol production and pipelines. Responsible for identifying environmental and social risks, providing strategies to de-risk the project, developing a detailed permitting plan with schedule.

**Environmental and Social Screening for the Just Energy Transition (JET) Project for the repurposing of the Hendrina Coal Power Plant, Mpumalanga, South Africa, Confidential Client (2023)**

Project Director of the E&S Screening Study for the repurposing of the Hendrina Coal Power Plant in Mpumalanga.

**ESIA Advisory for a 1.2 GW Green Hydrogen facility in Saldanha Bay, South Africa, Confidential Client (2023)**

E&S advisor for the establishment of a 1.2 GW greenfield green hydrogen project in Saldanha Bay on the West Coast of South Africa. The project components included generation, transmission, desalination and water pipelines, electrolysis and hydrogen storage and pipelines. Responsible for identifying environmental and social risks, providing strategies to de-risk the project, developing a detailed permitting plan with schedule, and contributing to a Stakeholder Engagement Plan and initial stakeholder engagement.

**ESIA for a 5GW Green Hydrogen/Ammonia Production and Export Project, Namibia, Hyphen Hydrogen Pty Ltd (2023)**

Project Director for an ESIA for a Green Hydrogen production and export project including 5GW wind and solar PV generation, transmission, desalination plant, water and gas pipelines, electrolyser and hydrogen storage, ammonia production and storage and associated port facilities.

**Scoping for full scale Green Hydrogen Production Facility on the Mogalakwena Platinum Mine in South Africa (2022)**

Project Director for an ESIA Scoping for the Anglo American's Full Scale Hydrogen Production Plant at Mogalakwena Platinum Mine in South Africa. The project forms part of Anglo American's NuGen™ programme as part of their FutureSmart Mining™ programme in order to develop a hydrogen-powered mining truck fleet in collaboration with leading fuel cell, electrolyser, battery and engineering firms.

**ESIA for the Coega Green Hydrogen/Ammonia Export Plant, Gqeberha, South Africa, Hive Hydrogen Pty Ltd (2022-23)** Project Director for an ESIA for a Green Hydrogen/Ammonia export project including the construction and operation of an electrolyser, hydrogen storage, ammonia production, storage and distribution to an associated port facility.

## **ESIA for a Hybrid Solar PV-BESS-Green Hydrogen Fuel Cell Power Plant in Swakopmund, Namibia (2022)**

Project Director for an ESIA for the establishment of the Renewstable® Swakopmund project, which will generate consistent, reliable, and clean renewable power from an intermittent source of energy. The Hybrid Power Plant consists of an 85 MW solar PV plant, Battery Energy Storage System, a desalination plant, electrolysis plant, hydrogen storage, a 6MW hydrogen fuel cell, substations and transmission lines.

## **ESIA for a 600MW Tankatara solar PV plant and associated transmission line, South Africa, Hive Hydrogen (2022)**

Project Director for an ESIA for a 600MW solar PV plant and associated transmission lines.

## **Environmental and Social Alternatives Assessment for a 5GW Green Hydrogen Project, Namibia, Confidential Client (2022)**

Project Director for an Environmental and Social Alternatives Assessment for a 5GW Green Hydrogen Project, Namibia. The project includes 5GW's of wind and solar PV generation, battery energy storage, transmission, desalination plant, water pipeline, electrolysis and hydrogen storage, ammonia production and storage and associated port facilities.

## **Regulatory Review for the permitting of green hydrogen and ammonia projects in South Africa, Confidential Client (2021)**

Project Director for the regulatory review for permitting of green hydrogen and ammonia projects in South Africa.

## **Environmental and Social Screening and constraints mapping for a 5GW green hydrogen project, Namibia, Confidential Client (2021)**

Project Director for an environmental and social screening and constraints mapping for green hydrogen project in response to the Namibian Governments RFP to conduct feasibility activities within the Tsau//Khaeb (Sperrgebiet) National Park for Renewable Wind Energy. NIPDB/RFP/SCDI/2021-001.

## **Position Paper of the green hydrogen market in South Africa, Confidential Client (2021)**

Researcher and lead author for a position paper on the green hydrogen market in South Africa including global trends and South African environmental regulatory requirements.

## **ESIA for four 250MW wind energy facilities and associated transmission lines, Red Cap (2021)**

Project Director for the ESIA for 4 x 250MW wind energy facilities and associated transmission line. The ESIA includes terrestrial and aquatic biodiversity, avifauna and bat monitoring, visual, social and heritage baseline studies, stakeholder engagement and compilation of an ESIA Report and ESMP.

## **Environmental and Social Screening Study for a Wind Energy Facility to provide power to a green hydrogen facility, Confidential Client (2021)**

Project Director for an Environmental and Social Screening Study for a Wind Energy Facility to provide power to a green hydrogen facility on the east coast of South Africa.

## **Environmental and Social Advisory Services for the establishment of a 300MW OCGT Power Plant in Richards Bay, Confidential Client (2020)**

Project Director to advise the client on the permitting issues associated with the development of a 300MW OCGT gas power plant in Richards Bay. The project needed to meet the Environmental Consent Criteria of Department of Mineral Resources and Energy (DMRE) Risk Mitigation Independent Power Producers Procurement Programme (RMIPPPP). SLR supported on all aspects of environmental permitting including EIA

authorisations, Water Use Licenses, Air Emissions Licenses, water use consents, etc. The project included the trucking of LPG from the Port of Richards Bay to the site, gas storage on site and an underground grid connection.

## **Environmental Authorisation Amendment (RMIPPPP) for a 1500MW OCGT/CCGT Power Plant in Atlantis, Confidential Client, South Africa (2020)**

Project Director for an amendment to an existing Environmental Authorisation to amend the project from a 1500MW OCGT/CCGT power plant fuelled by LNG, to a 150MW OCGT power plant fuelled by LPG. The project included the transport of LPG via truck to the site, storage of LPG on the site and associated grid connection. The amendment process required the re-assessment of the air emissions, noise, risk, ecology and birds, heritage and social aspects of the project. The intention of the client was to use the project as submission to the Department of Mineral Resources and Energy (DMRE) Risk Mitigation Independent Power Producers Procurement Programme (RMIPPPP). The project was prematurely halted and was not bid as part of the RMIPPPP.

## **Environmental Authorisation Review (RMIPPPP) for a 1507MW OCGT/CCGT Power Plant in Saldanha Bay, Confidential Client, South Africa (2020)**

Project Director for an amendment to an existing Environmental Authorisation to amend the project from a 1500MW OCGT/CCGT power plant fuelled by LNG, to a 150MW OCGT power plant fuelled by LPG. The project included the transport of LPG via truck to the site, storage of LPG on the site and associated grid connection. The amendment process required the re-assessment of the air emissions, noise, risk, ecology and birds, heritage and social aspects of the project. The intention of the client was to use the project as submission to the Department of Mineral Resources and Energy (DMRE) Risk Mitigation Independent Power Producers Procurement Programme (RMIPPPP). The project was prematurely halted and was not bid as part of the RMIPPPP.

## **ESIA for 4 x 100MW solar PV plants and associated transmission lines, Freestate, South Africa, Mainstream, (2020 - 21)**

Project Director for the ESIA for 4 x 100MW solar PV Plants associated transmission line. The ESIA includes terrestrial and aquatic biodiversity, avifauna, visual, social and heritage baseline studies, stakeholder engagement and compilation of an ESIA Report and ESMP.

## **Environmental and Social Impact Assessment for a 20MW solar PV plant and transmission line, Gigawatt Global, Liberia, (2020)**

Project Director for the ESIA a 20MW solar PV plant and associated transmission line. The ESIA includes biodiversity, social and heritage baseline studies, stakeholder engagement and compilation of an ESIA Report and ESMP. The ESIA will be aligned with the IFC Performance Standards.

## **ESIA for an 80-200 MW wind farm development, Mphepo Power, Zambia (2019-20)**

Project Director for the ESIA for the development of a wind farm in Zambia. The ESIA included terrestrial and aquatic, social, heritage, noise and visual baseline studies, stakeholder engagement and compilation of an ESIA Report and ESMP. The ESIA was aligned with the IFC Performance Standards.

## **Environmental and Social Impact Assessment for a Road Upgrade, QGMI, Ghana, (2019-20)**

Project Director for the Scoping Phase of the Environmental and Social Impact Assessment process for the proposed Winneba Obetsebi-Lamptey Flyover (Phase 2) project in Accra, Ghana in collaboration with local consultants. The project included additional visual impact assessment, air quality modelling and noise modelling. All work undertaken to IFC Performance Standards.

## **Environmental and Social Impact Assessment (ESIA) for the Gamsberg Mine Zinc Smelter, Black Mountain Mine (Vedanta), South Africa (2019-20)**

Project Director for the ESIA for a new zinc smelter and associated infrastructure to beneficiate the 250 000 to 300 000 tpa of zinc concentrate produced at the Gamsberg Zinc Mine Phase-1 concentrator plant. The ESIA included extensive baseline studies including biodiversity, social, air quality, noise, visual, hydrology, geohydrology, and climate change. The process included extensive stakeholder engagement during the scoping and impact assessment phase.

## **ESIA Scoping Phase for the desalination plant and water carrier system, NamWater, Windhoek Namibia (2019-20)**

Team member for the ESIA Scoping Phase for the proposed desalination plant and water carriage system to secure water supply to the central coast, Windhoek and en-route users. The Scoping Process included extensive stakeholder engagement and the Scoping Report was aligned with the KfW Sustainability Guidelines and World Bank Environmental and Social Standards.

## **Environmental & Social Due Diligence for 5MW solar PV plant, Confidential Client, Namibia (2019)**

Project Director for an Environmental and Social (E&S) Due Diligence (Red Flags only) of a 5 MW solar PV facility located near Outapi, Namibia.

## **Environmental & Social Screening Study for 20MW solar PV plant, CIGenCo, Eswatini (2019)**

Project Director for an Environmental and Social (E&S) Screening Study of two potential sites for development of solar PV projects as part of CIGenCo's bid as part of the Eswatini Independent Power Producers Policy (ESIPPP).

## **Permitting Strategy and Planning for the Rovuma LNG Project in Mozambique, ExxonMobil, Mozambique (2018-2019)**

Team member supporting Exxon with the permitting strategy and plans for the Rovuma LNG Project in northern Mozambique.

## **Environmental and Social Impact Assessment (ESIA) Gap Analysis for a 50MW solar PV Plant, Volt Renewable, Zimbabwe (2018)**

Environmental lead for the review of the locally approved EIA against the IFC Performance Standards. Gaps were identified and an Environmental and Social Action Plan (ESAP) developed to close the gaps.

## **Environmental and Social Impact Assessment (ESIA) Gap Analysis for a 5-star hotel development, Motal-Engil, Zimbabwe (2018)**

Environmental lead for the review of the locally approved EIA against the IFC Performance Standards. Gaps were identified and an Environmental and Social Action Plan (ESAP) developed to close the gaps.

## **Environmental and Social Screening Study for a 100MW hybrid HFO and Solar PV Power Plant for a mine in Mali, Confidential client (2018)**

Environmental lead for the screening of environmental and social risks for the development of a solar PV plant on a mine in Mali.

## **Environmental and Social Screening Study for 3 x 40MW solar PV plants, Confidential Client, GETFiT Zambia (2018)**

Project Manager for an environmental and social screening study for 3 x solar PV sites in Zambia. The Screening Study included the review of desk top information and site visits to assess environmental and social risks. A comparative analysis was undertaken to select the site with the least environmental and social risks. This was combined with the technical analysis to select the preferred site to be taken into more detailed studies.

**Environmental and Social Impact Assessment for a 40MW solar PV farm for Goldfield's South Deep Mine, Enel Green Power, South Africa (2017)**

Project Director for an Environmental and Social Impact Assessment for a 40MW solar PV plant for Goldfield's South Deep Mine in South Africa. The study included scoping and stakeholder engagement, various specialist studies and the compilation of an ESIA Report and ESMP.

**Environmental and Social Impact Assessment for 2 run-of-river Hydropower Plants and associated transmission lines in Northern Zambia, Globeleq, Zambia (2017)**

Project Director for an Environmental and Social Impact Assessment for 2 run-of-river hydropower plants and associated transmission lines on the Kalungwishi River in Northern Zambia. The study included scoping and stakeholder engagement, various specialist studies including environmental flow, heritage, social, biodiversity, visual, noise and other studies. All work was undertaken to IFC Performance Standards. The project was put on hold after the baseline and Scoping Phase.

**Environmental and Social Screening Study for a 212MW HFO Power Plant, Confidential Client, Angola (2017)**

Project Director for an Environmental and Social Screening Study for a 212MW HFO Power Plant in Angola. The study included noise and air quality baseline sampling, soil and groundwater baseline sampling, community health screening, and the compilation of a detail legal register and compliance road map.

**Environmental and Social Screening Study for a Hydropower Plant in Gabon, Confidential Client, Gabon (2017)**

Environmental and Social Screening Study for a Hydropower Plant in Gabon, Confidential Client, Gabon, 2017

**Environmental and Social Due Diligence (ESDD) for two Solar PV and two Wind Farm Projects South Africa, Confidential Client, South Africa (2017)**

Project Director for the ESDD for two Solar PV and two Wind Farm Projects in South Africa.

**Environmental, Health and Safety Risk assessment of four Solar PV sites in South Africa, Enel Green Power, South Africa (2017)**

Project Director for the EHS Risk Assessments.

**Environmental and Social Impact Assessment for a 100MW to 250MW solar PV Plant, Globeleq, Zambia (2016-17)**

Project Director for an Environmental and Social Impact Assessment for a 100MW to 250MW solar PV plant in Zambia. The study included the analysis of key environmental and social impacts, compilation of an ESIA and ESMP reports and stakeholder engagement.

**Environmental and Social Screening Study for a solar PV Plant, Confidential client, Zambia (2016)**

Project Director for an Environmental and Social Screening Study for the establishment of solar PV power plant in Zambia. The study included the analysis of key environmental and social risks including regulatory, biodiversity and social risks.

**Environmental and Social Due Diligence, Six Solar PV Farms, Confidential Client, South Africa (2016)**

Project Director for an ESDD for six solar pv farms in South Africa. The ESDD was undertaken against SA Legislation and Regulations and IFC Performance Standards.

## **Environmental and Social Impact Assessment for a CCGT Power Plant, ArcelorMittal, South Africa (2016)**

Project Director for an Environmental and Social Impact Assessment study for the establishment of a 1500MW CCGT power plant for ArcelorMittal in Saldanha Bay, South Africa. The ESIA includes detailed specialist studies including air emissions modelling, noise modelling, biodiversity and heritage assessment. Full stakeholder engagement is also part of the scope of work.

## **Environmental and Social Management Plans, Wind Farm Development, Confidential Client, Kenya (2016)**

Project Director and involved in advising the client on various strategies including vantage point bird monitoring and management plan development.

## **Environmental and Social Screening Study of potential solar PV sites, Confidential Client, Ivory Coast (2016)**

Environmental and Social Screening Study of potential solar PV sites, Confidential Client, Ivory Coast, 2016

## **Environmental and Social Impact Assessment for the Tete-Macuse Railway Line and Macuse Power Development, Italthai, Mozambique (2015-17)**

Project Director for the Environmental and Social Impact Assessment (ESIA) for the proposed Tete-Macuse railway line and Macuse Port development for the export of coal from Tete Province in Mozambique. The project included the development of over 700km of railway line and a new port development.

## **Strategic Environmental Assessment for the supporting infrastructure for the Baynes Hydropower Project, Baynes PJTC, Namibia/Angola (2014-15)**

Project Director for the Strategic Environmental Assessment of the associated infrastructure for the Baynes hydropower project. The SEA covered the assessment of access roads for construction, transmission lines routing in Angola and Namibia and locations of an airfield.

## **Cumulative Impact Assessment of the development of numerous hydropower plants on the Kwanza River, Odebrecht, Angola (2014-15)**

Project Director for the Cumulative Impact Assessment of the development of a number of hydropower plants on the Cuanza River in Angola.

## **Environmental and Social Impact Assessment for the Batoka Gorge Hydropower Project, ZRA, Zambia/Zimbabwe (2014-15)**

Advisor to the ESIA team undertaking the Environmental and Social Impact Assessment (ESIA) for the proposed Batoka Gorge Hydropower Plant on the Zambezi River below the Victoria Falls. The project includes the construction of a dam wall, hydropower plants, transmission lines and associated infrastructure. The ESIA is being conducted in alignment with the IFC Performance Standards and the World Bank Safeguard Policies.

## **Environmental and Social Impact Assessment for the Rehabilitation of the Kariba Dam Wall, ZRA, Zambia/Zimbabwe (2014-15)**

Project Director for the Environmental and Social Impact Assessment (ESIA) for the proposed Kariba Dam Rehabilitation Project. The project includes the rehabilitation of the plunge pool and spillway of the dam wall. The project is being funded by the World Bank, African Development Bank and the EU.

## **Environmental and Social Due Diligence (ESDD) for a 98 MW wind farm in South Africa, Confidential Client, South Africa (2015)**

Project Director for the ESDD.

## **Environmental and Social Due Diligence (ESDD) for a 2 x 75 MW solar pv farm in South Africa, Confidential Client, South Africa (2015)**

Project Director for the ESDD.

**Environmental and Social Due Diligence (ESDD) for a 74 MW wind farm in South Africa, Confidential Client (2015)**

Project Director for the ESDD.

**Environmental and Social Screening Study for a CCGT Power Plant in Saldanha Bay, Confidential Client, South Africa (2015)**

Project Director for an Environmental and Social Screening study for the establishment of a gas power plant in Saldanha Bay, South Africa. The screening study outputs included a permitting strategy, environmental opportunities and constraints maps, and input into the site selection process.

**Environmental and Social Impact Assessment for Floating Power Plants in the Port of Richards Bay, Department of Energy IPP Office, South Africa (2015-16)**

Project Director for the ESIA for the establishment of Floating Power Plants in the Ports of Richards Bay in South Africa. The ESIA includes detailed specialist studies including marine outfall modelling, air emissions modelling and marine ecology studies. Full stakeholder engagement is also part of the scope of work.

**Environmental and Social Impact Assessment for Floating Power Plants in the Port of Richards Bay, Department of Energy IPP Office, South Africa, (2015-16)**

Project Director for the ESIA for the establishment of Floating Power Plants in the Ports of Saldanha in South Africa. The ESIA includes detailed specialist studies including marine outfall modelling, air emissions modelling and marine ecology studies. Full stakeholder engagement is also part of the scope of work.

**Environmental and Social Impact Assessment (Scoping Phase) for LNG Import Terminal in the Port Richards Bay for the Gas to Power Programme, Department of Energy IPP Office, South Africa (2015-16)**

Project Director for the ESIA for the establishment of LNG Import Terminals as part of the DoE's Gas to Power Programme in South Africa. The ESIA (Scoping Phase) included scoping of detailed specialist studies including marine outfall modelling, air emissions modelling and marine ecology studies. Full stakeholder engagement is also part of the scope of work.

**Environmental and Social Impact Assessment (Scoping Phase) for LNG Import Terminal in the Port Saldanha for the Gas to Power Programme, Department of Energy IPP Office, South Africa, (2015-16)**

Project Director for the ESIA for the establishment of LNG Import Terminals as part of the DoE's Gas to Power Programme in South Africa. The ESIA (Scoping Phase) included detailed specialist studies including marine outfall modelling, air emissions modelling and marine ecology studies. Full stakeholder engagement is also part of the scope of work.

**Environmental and Social Screening study for the establishment of an CCGT power plant in the Ports of Richards Bay, Confidential client, South Africa (2015)**

Project Director for an Environmental and Social Screening Study for the establishment of a CCGT power plant in Richards Bay, South Africa. The study included the analysis of key environmental and social risks including air emissions, effluent emissions, biodiversity (terrestrial and marine) and social issues. The assessment applies to the power plant site, transmission line routing and pipeline routing and compares the opportunities and constraints associated with the two locations.

**Environmental and Social Screening study for the establishment of an CCGT power plant in the Port of Saldanha, Confidential client, South Africa (2015)**

Project Director for an Environmental and Social Screening Study for the establishment of a CCGT power plant in Saldanha Bay, South Africa. The study included the analysis of key environmental and social risks including air emissions, effluent emissions, biodiversity (terrestrial and marine) and social issues. The assessment applies to the power plant site, transmission line routing and pipeline routing and compares the opportunities and constraints associated with the two locations.

**Environmental and Social Screening study for the establishment of an SCGT power plant in the Ports of Saldanha, Confidential client, South Africa (2015)**

Project Director for an Environmental and Social Screening Study for the establishment of an SCGT power plant in the Port of Saldanha. The study included the analysis of key environmental and social risks including air emissions, effluent emissions, biodiversity (terrestrial and marine) and social issues. The assessment applies to the power plant site, transmission line routing and pipeline routing.

**Environmental and Social Impact Assessment for the Burgan Oil Fuel Storage Depot in the Port of Cape Town, Burgan Oil, South Africa (2014-15)**

Project Director for the ESIA for the Burgan Oil Fuel Storage Depot in the Port of Cape Town.

**Millennium Challenge Account – Malawi: Infrastructure Development Project – Energy Sector (hydropower plants, transmission and distribution lines and substations), MCC, Malawi (2014-15)**

Environmental Lead for the Independent Engineer to review all the Contracting Engineers environmental and social studies associated with the Infrastructure Development Project. The project includes the upgrade and development of new power infrastructure including hydropower plants, transmission lines, distribution lines and substations.

**Strategic Environmental Assessment of the New Town Integrated Development Zone, TFM Mining, Katanga Province, DRC (2014)**

Project Director for the Strategic Environmental Assessment of the New Town Integrated Development Zone undertaken for Tenke Fungurume Mining (TFM) in Katanga Province, DRC.

**Environmental and Social Impact Assessment (ESIA) for the Gamsberg Zinc Mine, South Africa, Black Mountain Mine (Vedanta) (2012-13)**

Project Director for the Environmental and Social Impact Assessment for a new Zinc Mine in the Northern Cape Province in South Africa. The ESIA includes the assessment of the mine and all associated infrastructure including waste rock dumps, tailing dams, processing plant, transmission lines, a new township development, upgrade of a water pipeline and associated water treatment facilities, and transport options to the Port of Saldanha via both road and rail. The ESIA is being undertaken as an integrative process to meet various environmental legal requirements including National Environmental Management Act (NEMA): EIA Regulations, NEM: Waste Act, NEM: Air Quality Act, NEM: Biodiversity Act, National Heritage Resource Act, National Water Act and the Minerals Petroleum Resources Development Act. The process includes various specialist studies, full stakeholder engagement as well as integration with a Biodiversity Off-sets process.

**Environmental and Social Impact Assessment for the Expansion of Transnet's existing Manganese Ore Export Railway Line and Associated Infrastructure, South Africa (2012)**

Project Director for the ESIA for the Expansion of Transnet's existing Manganese Ore Export Railway Line and Associated Infrastructure in the Northern and Eastern Cape, South Africa.

## **Ore Line Expansion Project for the Sishen-Saldanha Ore Line and Port of Saldanha, various Mining Companies and Transnet, South Africa (2011-2012)**

Project Director for the Environmental and Social Screening Study for the Pre-feasibility Phase of the Ore Line Expansion Project. This included compiling a detail Environmental and Social Design Criteria Report together with initial Stakeholder Engagement. A detailed multi-criteria assessment for various port and stockpile options was undertaken. The project included upgrading over a 1000 km of railway line and upgrading the port facilities including stockpiles, stacker-reclaimers, conveyors and ship loading facilities. The stakeholder engagement process was specifically designed to obtain buy-in from stakeholder who were strongly opposed some components of the port and rail expansion.

## **Strategic Environmental Assessment for the Mozambican Regional Gateway Programme, MRGP, Mozambique, Malawi, Zambia, Zimbabwe (2012)**

Project Director for the SEA of the MRGP. The MRGP aims to support the improvement of the Southern African transport (roads, rail and ports), regional infrastructure network, which uses Mozambique as a gateway for international trade. The MRGP geographic scope encompasses the Beira and Nacala Transport Corridors and the respective links to the Maputo and Limpopo Corridors. The SEA identified environmental and social issues that need to be considered in the long terms planning an implementation of the rail and port infrastructure that makes up the Beira and Nacala Transport Corridors.

## **Strategic Environmental Assessment (SEA) for the coastline of Mozambique, MICOA, Mozambique (2012)**

Adviser on the SEA for the coast of Mozambique. The SEA aims to identify potential conflicts between various uses of the coastal zone and to recommend strategic interventions to facilitate sustainable development within the coastal zone. Various users of the coastal zone that are being considered include off-shore oil and gas operations, coastal mining, tourism, conservation and artisanal and industrial fishing.

## **Environmental and Social Screening Study for port options in Pemba Bay, Anadarko, Mozambique (2012)**

Project Lead for an Environmental and Social Screening Study for various port options in Pemba Bay. The screening study includes a multi-criteria assessment of various port locations taking into account marine and terrestrial ecology, social issues, land ownership, legal aspects and physical marine conditions.

## **Environmental and Social Impact Assessment for a LPG import and distribution facility, Sunrise Energy, South Africa (2011-2012)**

Project Director for the Scoping/EIA for a LPG importation, storage and distribution facility which includes a marine offloading facility in Saldanha Bay, a pipeline and a storage facility. The environmental permitting process required the liaison with local and provincial environmental authorities, co-ordination of specialist studies, public participation and impact assessment.

## **Environmental and Social Screening Study for a Mine development in Angola, Confidential Client, Angola (2011-2012)**

Project Director for the Environmental and Social Screening Study for the Concept Phase for a new mine development in Angola. The study included identifying environmental and social risks to the project and costing a full ESIA according to IFC Performance Standards and Equator Principles.

## **Equator Principles and IFC Performance Standards Training, Vedanta Resources Plc, Zambia (2012)**

Lead facilitator of a 5-day training course on the implementation of the Equator Principles and IFC Performance Standards for a number of Vedanta's mining operations across Southern Africa, Europe and Australia.

## **Environmental and Social Impact Assessment for the upgrade of the Principe Airport, HBD, Principe (2011-2012)**

Project Director for the Environmental and Social Impact Assessment for the upgrade of the airport in Principe.

## **EIA for a 380MW renewable energy facility north of Touwsrivier in the Western Cape (2010-2011)**

Project Director for the Scoping/EIA for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.

## **EIA for a 170MW renewable energy facility east of Touwsrivier in the Western Cape (2010-2011)**

Project Director for the Scoping/EIA for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.

## **EIA for a 670MW renewable energy facility south of Sutherland in the Western and Northern Cape (2010-2011)**

Project Director for the Scoping/EIA for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process requires the liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.

## **EIA for a 500MW renewable energy facility south of Beaufort West in the Western Cape (2010-2011)**

Project Director for the Scoping/EIA for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.

## **EIA for a 120MW renewable energy facility south east of Victoria West in the Northern Cape (2010-2011)**

Project Director for the Scoping/EIA for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.

## **EIA for a 225MW wind farm in the Richtersveld, Western Cape (2011)**

Project Director for the Scoping/EIA for a proposed wind farm. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.

## **EIA for a 750MW wind farm in the Roggeveld, Western Cape and Northern Cape (2011)**

Project Director for the Scoping/EIA for a proposed wind farm. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.

## **EIA for a 225MW renewable energy facility between Vredenburg and Velddrif in the in the Western Cape (2010-2011)**

Project Director for the Scoping/EIA for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies, public participation and impact assessment.

## **Environmental and Social Impact Assessment for the Lesotho Highland 150 MW Wind Power Project, Breeze Power, Lesotho (2011)**

Project Director for the Scoping Phase of the Environmental and Social Impact Assessment for a 150MW wind farm development in Lesotho. The Scoping Phase included the analysis of available information to identify key environmental and social risks associated with the siting of the wind farm.

## **Environmental Screening Study for a Wind Farm Development in the Southern Cape, South Africa (2011)**

Project Director for the Environmental Screening Study for a wind farm development in the Southern Cape.

## **Environmental and Social Due Diligence for a Wind Farm Development in Coega, Electrawinds, South Africa (2011)**

Project Director for the Environmental and Social Due Diligence for a wind farm development in the Coega.

## **Environmental and Social Impact Assessment for Venetia Diamond Mine, De Beers, South Africa (2011)**

Project Director for the Scoping and ESIA for the proposed new underground mine and EMP consolidation for existing mining activities. The ESIA was undertaken as an integrative process to meet various environmental legal requirements including National Environmental Management Act (NEMA): EIA Regulations, NEM: Waste Act, NEM: Air Quality Act, NEM: Biodiversity Act, National Heritage Resource Act, National Water Act and the Minerals Petroleum Resources Development Act.

## **Environmental and Social Impact Assessment for a river barging project on the Zambezi River, Riversdale Mining, Mozambique (2010-2011)**

Project Director for the project which includes the assessment of environmental and social impacts associated with dredging over 500km of the Zambezi River. The project includes full stakeholder engagement, coordination of various specialist studies with extensive field work and the integration of all information into an ESIA report and ESMP.

## **EIA for two solar PV plant development, South Africa (2010)**

Project Director of the EIA for the development of two solar PV plants in the Northern Cape and Free State Provinces of South Africa. ERM undertook the required studies to obtain environmental approval for these developments, including specialist studies such as landscape and visual and cultural heritage assessments, and stakeholder engagement.

## **Basic Assessment for the installation of wind measuring masts on six sites in the Western Cape and two sites in the Northern Cape (2010)**

Project Director for the Basic Assessments to install wind measuring masts at eight sites in South Africa. The scope of work included the submission of the application, public participation, preparation of an EMP and submission of the Basic Assessment report.

## **EIA for a 100MW renewable energy facility north of Velddrif in the in the Western Cape (2010)**

Project Director for the Scoping process for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required the liaison with local, provincial and national environmental authorities, co-ordination of specialist studies and public participation.

## **EIA for a 300MW renewable energy facility east of Lambert's Bay in the Western Cape (2010)**

Project Director for the Scoping process for a proposed renewable energy facility incorporating wind and photovoltaic power generating technologies. The environmental permitting process required liaison with local, provincial and national environmental authorities, co-ordination of specialist studies and public participation.

## **External adviser and reviewer for an ESIA for a wind farm development in the Eastern Cape, Confidential Client, South Africa (2010)**

Adviser and reviewer for an EIA for the development of a wind farm in the Eastern Cape.

## **Environmental Advisor Environmental and Social Impact Assessment for the Mphanda Nkuwa Hydropower Project in Mozambique (2010)**

Advisor for the ESIA for the Mphanda Nkuwa Hydropower Project in Mozambique. The core service was to advise the project team on international standards such as the IFC Performance Standards and World Commission on Dams.

## **Environmental Sensitivity Study of the Durban Airport Site Expansion Project, South Africa, Transnet (2010)**

Project Director for the Environmental Sensitivity Study for the proposed dig-out port currently being considered by Transnet at the Durban International Airport Site. The aim of this assessment was to determine the biophysical, natural and social opportunities and constraints to the development of the dig-out port, as well as provide a strategic overview of the environmental context of the site. In addition, the sensitivity study provided strategic guidance in terms of the environmental due process and licensing requirements with respect to the National Environmental Management Act, and associated legislation.

## **ESIA for a new high voltage overhead transmission power line in Cameroon, AES Sonel, Cameroon (2007-2009)**

Project Director for the Environmental and Social Impact Assessment and a full Resettlement Action Plan for a new electricity distribution project, comprising a 113km overhead power line, for AES Sonel. As Project Director, Mr Heather-Clark was responsible for client liaison, quality control and final review of all reports.

## **Advisor to the Environmental and Social Impact Assessment for the Baynes Hydropower Project in Namibia and Angola (2009)**

Project Advisor for the Environmental and Social Impact Assessment for the proposed Baynes Hydropower Project on the Kunene River. The ESHIA process is being conducted in accordance to the Angolan EIA Regulations, the Namibian EIA Regulations, the World Bank Safeguard Policies and the IFC performance standards.

## **Environmental and Social Impact Assessment for the upgrade of a 1100 km railway line in South Africa, Transnet (2008-2009)**

Project Director for the Environmental and Social Impact Assessment for the upgrade of a commodities railway line across South Africa. The project included a number of specialist studies, managing subcontractors, interfacing with the railway engineering team, report writing, managing an extensive stakeholder consultation process, client liaison and management of project finances.

## **Environmental and Social Impact Assessment for the services corridor associated with the development of a greenfield CTL Plant, Sasol, South Africa (2009)**

Project Director for an ESIA of a services corridor to support the development of a greenfield CTL plant development in South Africa. The ESHIA process was conducted in accordance to the South African EIA Regulations and the IFC performance standards.

## **Environmental and Social Impact Assessment for 2D seismic exploration project in the Rovuma Basin, Petronas, Mozambique (2009)**

Project Director for the ESIA for the offshore seismic exploration activities in Blocks 3 & 6, situated in the Rovuma Basin off the coast of Mozambique. The exploration activities comprise 2D seismic surveys in deepwater.

## **Environmental and Social Screening Study for a river barging project on the Zambezi River, Riversdale Mining, Mozambique (2009)**

Project Director for the project which included the assessment of environmental and social risks associated with dredging over 500km of the Zambezi River. The project included reviewing existing information, mapping key sensitivities and facilitating a specialist workshop in order to develop Terms of Reference for detailed baseline studies that will be required should the project proceed to a full ESIA.

## **Equator Principled and IFC Performance Standards Review and Training, African Housing Solutions, South Africa (2009)**

Lead reviewer for the ESIA and Resettlement Policy Framework, for a housing development in Nigeria, against the Equator Principles and IFC Performance Standards. Mr Heather-Clark was responsible for reviewing the ESIA Report and for presenting a 2 ½ day training course on the Equator Principles and IFC Performance Standards.

## **Environmental Assessment for the dredging and disposal of dredge spoil at the Port of Saldanha, Transnet, South Africa (2008)**

Project Director for this project and was responsible for guidance of technical studies which included dredging studies and marine sediment contamination characterization. The study included the assessment of dredge spoil dumping alternatives. Stakeholder engagement included an important component of the project.

## **Environmental and Social Screening Study, Port of Saldanha, Transnet, South Africa (2008)**

Project Director for the screening study which included an assessment of alternative berth options for the export of iron ore at the iron ore terminal at the Port of Saldanha, South Africa. The work included ongoing interaction with the port engineering and design teams, together with stakeholder engagement.

## **ESIA for an Early Production System (EPS) and Power Plant for Kaiso-Tonya Area, Exploration Area 2, Tullow Uganda Operations Pty Ltd, Uganda (2007-08)**

Project Director for the project which included a full ESIA for an Early Production System and associated Power Plant in the Kaiso-Tonya area on the banks of Lake Albert, Uganda. The intent of the project is to produce oil (and small amounts of gas) which will be converted into electrical power and distillate products (kerosene and diesel) for consumption within Uganda. The electrical power will be fed into the main grid supplementing the Ugandan electrical power grid while the distilled products (diesel and kerosene) will be used to displace the currently imported fuels. The ESIA included a detailed assessment of alternative sites for the proposed EPS and power plant, together with various environmental and social baseline studies and stakeholder engagement.

## **ESIA monitoring studies for Sasol's Off-shore gas exploration activities in Inhambane and Sofala Provinces, Mozambique, Sasol Petroleum Sofala & Empresa Nacional de Hidrocarbonetos (2007-08)**

Project Director for an environmental monitoring survey programme for Sasol's offshore hydrocarbon exploration activities. Monitoring studies included seismic noise modelling and monitoring, dugong surveys, artisanal fish catch monitoring, coral reef surveys and monitoring, sea turtle monitoring and tourism monitoring.

## **Strategic Environmental and Social Overview and ESIA for offshore exploration well drilling activities in Blocks 2 and 3A, Lake Albert, Uganda. Tullow Oil Plc and Heritage Oil and Gas Limited (2006-2008)**

Project Director for this project. The project involved undertaking a strategic overview study of Lake Albert that provided background information on the limnological (physical, chemical and biological) features of the lake as well as environmental and socio-economic resources (such as nature reserves, tourism nodes, prime fishing areas etc). It also presented areas of environmental risk and opportunity associated with oil explorations on, and immediately adjacent to, the lake. The strategic overview provided a framework within which ESIA's were undertaken for the offshore drilling project. A site selection study was undertaken for onshore support infrastructure. Baseline studies included shoreline sensitivity mapping, oil spill modelling, water and sediment quality surveys, fish and fisheries surveys, socio-economic surveys and terrestrial ecology surveys. An extensive public participation process was undertaken as part of the ESIA's.

## **Environmental and Social Baseline Assessment for a green fields coal mine and CTL plant development, Sasol, South Africa (2008)**

Project Director the environmental and social baseline studies to support the evaluation of sites for potential development of a green field's coal mine and associated CTL Plant in South Africa. Mr. Heather-Clark has assisted with review and quality control of the various baseline studies.

## **Development of guideline document for the integration of environmental and social issues into the project lifecycle for mine development, De Beers, South Africa (2008)**

Team member of the project team that assisted the client in developing a detailed guideline document for the integration of social and environmental issues into mine planning. This included all phases of the planning process from Concept through to Pre-feasibility, Feasibility and Implementation. Mr Heather-Clark, as lead facilitator, presented a 2 day training course on these guidelines, to mine planners and engineers.

## **EIA for a Metal Recovery Plant and Slag Crushing, Screening and Weathering facility at Arcelor Mittal Saldanha Works, MultiServ, South Africa (2007-2008)**

Project Director for the EIA, including a public consultation process and the following specialist studies: air quality, groundwater, noise impact assessment, botanical and archaeology studies and a traffic impact assessment. Mr Heather-Clark was responsible for client liaison, quality control and final review of all reports.

## **Implementation of the Equator Principles for Standard Bank's Project Financing Processes, Standard Bank, South Africa (2008)**

Lead facilitators for Equator Principles and IFC Performance Standards training to assist Standard Bank in adopting the Equator Principles. An assessment system (based on the IFC Performance Standards) to link with Standard Bank's project finance transaction life-cycle was developed. This involved the development of "tools" and guidance documents to form a system, together with training on the use of the system for all project finance staff.

## **Comparative review of EIAs undertaken by ERM globally for electricity utilities, Eskom, South Africa (2007)**

Project Director for this project. The project included research to provide Eskom with an overview of different EIA governance systems and approaches to managing EIAs in other countries, as well as identifying trends in EIA practice.

## **Environmental and Social Screening and Qualitative Risk Assessment Western Ports and Rail Corridor, Transnet, South Africa (2007)**

Project Director involved in identifying environmental and social risks associated with future port development in the Port of Saldanha, Port of Cape Town and Port of Mossel Bay. The scope of the study included the review of previous EIAs, SEAs and other planning documents to identify environmental and social drivers and assess their risk to future port planning, development and operations. As the environmental team, ERM interacted on a regular basis with the port engineering and design teams to develop a port development framework for a 30 year planning period.

## **Environmental and Social Screening and Qualitative Risk Assessment Central Ports and Rail Corridor, Transnet, South Africa (2007)**

Project Director involved in identifying environmental and social risks associated with future port development in the Port of East London, Port of Port Elizabeth and Port of Ngqura. The scope of the study included the review of previous EIAs, SEAs and other planning documents to identify environmental and social drivers and assess their risk to future port planning, development and operations. As the environmental team, ERM interacted on a regular basis with the port engineering and design teams to develop a port development framework for a 30 year planning period.

## **Environmental and Social Screening and Qualitative Risk Assessment Eastern Ports and Rail Corridor, Transnet, South Africa (2007)**

Project Director involved in identifying environmental and social risks associated with future port development in the Port of Durban and Port of Richards Bay. The scope of the study included the review of previous EIAs, SEAs and other planning documents to identify environmental and social drivers and assess their risk to future port planning, development and operations. As the environmental team, ERM interacted on a regular basis with the port engineering and design teams to develop a port development framework for a 30 year planning period.

## **EIA of the Moatize Coal Mine and associated railway line and deep water port infrastructure, CVRD, Tete Province, Mozambique (2006-2007)**

Project Coordinator and Cost Controller on this project. ERM was commissioned by CVRD, a Brazilian Mining Company, to undertake environmental studies related to the green fields development of a coal mine in Tete Province, Mozambique. The project included the development of a power plant, railway line and port for the export of coal.

## **Corporate Social Responsibility Strategy development for a leading South African retailer, South Africa (2006)**

Lead facilitator for this project. The project involved identifying and prioritising the company's sustainability issues and defining a strategy to address these issues. The process was driven by the need for the company to be listed on the Johannesburg Stock Exchanges SRI Index.

## **Research project on the effects of water scarcity on the fresh produce supply to a major South Africa retailer, South Africa (2006)**

Project Leader coordinated a group of researchers to identify water scarce areas and to plot these against the location of fresh produce suppliers for a major retailer in South Africa. This researched form a core component of the companies Sustainability Strategy.

## **Independent Environmental Advisers to the Financing Parties of the Gautrain Rapid Rail Link project, Bowman Gilfillan (2006)**

Independent Environmental Advisers to the Financing Parties, provided review and advisory services through Bowman Gilfillan on Environmental Management Plans for the Gautrain Rapid Link project.

**ESIA for seismic surveys and exploration well drilling and testing in Blocks 16 and 19 off the coast of Mozambique, Sasol Petroleum Sofala & Empresa Nacional de Hidrocarbonetos (2005-2006)**

Project Manager for the ESIA which involved undertaking an ESIA and compiling EMPs for offshore exploration activities in Blocks 16 & 19, situated to the east of the Bazaruto Archipelago National Park, off the coast of Mozambique. The exploration activities comprised 2D and 3D seismic surveys in deepwater and shallow water as well as exploration well drilling and testing activities.

**EIA for the upgrade and expansion of the existing sinter plant at Vanderbijlpark, ArcelorMittal, South Africa (2006)**

Project Director for the EIA and stakeholder engagement process to meet South African requirements. This included coordination of the technology review, air quality, health and waste management specialist studies and compilation of the integrated Scoping and EIA Report.

**Review of Sustainability Report and Sustainability Management System, Confidential, South Africa (2004)**

Lead reviewer of the Sustainability Report of a leading retailer in South Africa and providing adhoc advice on sustainability issues. This included compiling a monthly news letter to staff on relevant sustainability issues facing the retail industry in South Africa.

**EIA of a proposed expansion of the Container Terminal Stacking area at the Port of Cape Town, National Ports Authority, South Africa (2003-2004)**

Project Manager for this EIA. The project included the expansion of the Cape Town container terminal into the sea through dredging 1 million m<sup>3</sup> of material for reclamation. The project included a detailed study on alternative sources for fill material and other studies which focused on marine archaeology, coastal erosion, marine hydrodynamics and water quality, visual, noise and traffic. The EIA included full stakeholder engagement throughout the EIA process.

**Environmental Site Suitability Study for a manganese smelter, Asia Minerals Limited (2004)**

Part of the project team that undertook a preliminary site selection process for a manganese smelter by identifying key environmental and social issues for potential sites within Southern Africa. Sites included the Belualane Industrial Park (Mozambique) and Richards Bay, the Coega Industrial Development Zone (IDZ) and Saldanha (South Africa).

**DFID funded project to assess progress towards meeting the water related targets of the Millennium Development Goals, DIFD, Zambia (2004)**

Country Coordinator for Zambia on this project. The project included detailed stakeholder surveys secondary data analysis to establish the countries progress towards meeting the Millennium Development Goals, specifically related to water supply and sanitation.

**Roll-out of ISO14001 and OHSAS18001 management systems to 2 industrial sites in South Africa, Confidential, South Africa (2004)**

Project Manager responsible for undertaking ISO14001 training at two industrial sites. The project formed part of a global initiative to have several industrial sites throughout Africa and Europe ISO14001 certified.

**Strategic Environmental Assessment (SEA) for the Port of Cape Town, National Ports Authority of South Africa, South Africa (2003)**

Project Manager for this project and played a lead role in directing the course and outcome of the SEA. The SEA focussed on key environmental and social opportunities and constraint to the future long-term development of the Port of Cape Town. A Sustainability Framework was developed to address key opportunities and constraints and to set up long terms monitoring programs. A key component of this study was to understand the Port-City

linkages and developing mechanisms to ensure that port planning was supported by city planning and visa-versa.

## **Strategic Environmental Assessment (SEA) for the Port of Richards Bay, National Ports Authority of South Africa, South Africa (2003)**

Project Adviser for this project and played a lead role in directing the course and outcome of the SEA. The SEA focussed on key environmental and social opportunities and constraint to the future long term development of the Port of Cape Town. A Sustainability Framework was developed to address key opportunities and constraints and to set up long terms monitoring programs. A key component of this study was to understand the Port-City linkages and developing mechanisms to ensure that port planning was supported by city planning and visa-versa.

## **E&S Due Diligence of the Phase 2 Maputo Port Revitalisation and Rehabilitation Project, Standard Corporate Merchant Bank, Mozambique (2003)**

Environmental Adviser to the Standard Corporate Merchant Bank for the review of the EIA and Risk Assessment studies undertaken for the Phase 2 Maputo Port Revitalisation and Rehabilitation Project. The EIA was reviewed against the Mozambican and International Best Practice guidelines and detailed recommendation made on how to manage the environmental risks associated with the revitalisation project.

## **National Oil Spill Contingency Plan for Cameroon, funded by the World Bank, Cameroon Government, Cameroon (2003)**

Part of the team that compiled a comprehensive Oil Spill Contingency Plan for Cameroon (OSCP). The OSCP form a core component of the Chad Cameroon Pipeline and included contingency plans for both on land and marine based spills. The OSCP was compiled according to the IPEACA guidelines and was reviewed by the World Bank.

## **EIA/SEA Capacity Building, Environmental Public Authority (EPA), State of Kuwait (2003)**

Lead facilitator for a 2 day training course on SEA and EIA for the Environmental Public Authority (EPA) of the State of Kuwait.

## **Training Workshop on Strategic Environmental Assessment for South Eastern Africa and the Western Indian Ocean Island States, SEACAM, Mozambique (2003)**

Lead course facilitator for the SEA training course funded by SEACAM. The training course included the principles of SEA, SEA process and case studies of SEA's in Southern Africa.

## **Improving the Effectiveness of EIA and the Potential of SEA in Southern Africa: Case Study on SEA of the National Commercial Ports Policy and SEA for the Port of Cape Town, World Bank/SAIEA, Namibia (2003)**

Presenter of two case studies on SEA at a regional workshop funded by the World Bank and SAIEA.

## **Environmental Impact Assessment for the Eskom SABRE-GEN wind turbine test facility, Eskom, South Africa (2002)**

Project Manager for the EIA. The EIA included stakeholder engagement throughout the process and included the following specialist studies: visual assessment, bird strike modelling and noise assessment.

## **Strategic Environmental Assessment: Scoping Phase Port of Richards Bay, National Ports Authority of South Africa, South Africa (2002)**

Project Leader and integrative writer for the Scoping Phase of the SEA for the Port of Richards Bay. This phase included detailed stakeholder consultation to identify opportunities and constraints to long term port development at the Port of Richards Bay.

## **White Paper on National Commercial Ports Policy, National Ports Authority, South Africa 2002**

Lead reviewer of the White Paper on National Commercial Ports Policy for South Africa. The review focussed on the integration of environmental and social issues into the port planning process. Mr Heather-Clark made a formal submission and presentation to the Portfolio Committee on Transport in the South African Parliament.

## **Environmental Liability and Risk Assessment for the Multi-Purpose Terminal at the Port of Saldanha, National Ports Operations, South Africa (2002).**

Project Manager for the project. The purpose of the project was to identify key environmental risks associate with the material handling at the Multi-Purpose Terminal at the Port of Saldanha.

## **Environmental Overview of South Africa's major ports with special reference to future container terminal development, National Ports Authority Container Terminal Strategy, National Ports Authority, South Africa (2002)**

Project Manager for the comparative assessment of the relative environmental sensitivity of the seven commercial ports in South Africa with reference to future container terminal development. The study included a detail review of secondary environmental information of all the ports, the identification of specific environmental criteria and the use of these criteria to rank each port in terms of its sensitivity to future container terminal development.

## **Review of the EIA undertaken for the Maputo Port Privatisation and Rehabilitation Project, Development Bank of Southern Africa (DBSA), South Africa (2002)**

Environmental Adviser to the Development Bank of Southern Africa to review the Phase 1 EIA for the Maputo Port Privatisation and Rehabilitation Project. The review was undertaken against the Mozambican EIA Regulations and International Best Practice.

## **Oil Spill Contingency Plan, Agip Angola oil operations, Angola, (2002)**

Team member of the team to develop an oil spill contingency plan according to the IPEICA International Guidelines.

## **Ecologically Sustainable Industrial Development Programme, United Nations Industrial Development Organisation (UNIDO), Tanzania (2002)**

Team member of the project team appointed to review the Industrial Development Strategy for Industrial Development in Tanzania. The focus of the project was to integrate environmental and social issues into the programme.

## **Environmental Audit and Assessment of the Socio-economic Impacts of the Trans-Kgalagadi Highway, Botswana, Development Bank of Southern Africa, Botswana (2002)**

Lead reviewer of the EIA and EMP implementation for the Trans-Kalagadi corridor in Botswana. The review included site visits, detailed interviews and review of secondary data and records.

## **World Bank EIA Project Management Training Course, World Bank/SAIEA, Zambia (2002)**

Lead facilitator for the 5 day EIA Project Management Training Course. The course was presented to 20 African delegates from southern Africa. The course focused on the practical aspects of EIA project management including budgeting and scheduling an EIA, contract negotiations with clients, managing specialist studies, managing the public participation phase and compiling an integrated EIA report. The course formed part of a Southern Africa capacity building initiative lead by the SAIEA.

## **Environmental screening study for the establishment of a deep-water port at Ponta Dobela, Confidential Client, Mozambique (2001)**

Team member of the project team who undertook a screening study to identify environmental, social and economic issues and show stoppers associated with the development of a deep-water port on the coast on Mozambique.

## **ESIA of the proposed seismic survey in licence area 2814a on the continental shelf of Namibia, Shell Exploration and Production Namibia B.V. Namibia (2001)**

Team member of the ESIA for the offshore seismic exploration project. The ESIA included all issues associated with seismic surveys including seismic noise impacts on marine mammals, oil spill modelling and general environmental management issues.

## **Environmental Impact Review for the abandonment of the Cuntala Well Protector Platform off the coast of Angola (Block 2), Texaco Panama Inc., Angola (2001)**

Team member of the project team who developed a decommissioning plan for a well protector platform off the coast of Angola.

## **Legal, Technical and Economic Feasibility Study for the Commercialisation of the SSF Association Milnerton Tank Farm and its links to the Port of Cape Town, SFF, Cape Town (2001)**

Project Manager for this project.

## **ESIA of the Phase 2 expansion of the Mozal Aluminium Smelter and Matola Port Terminal in Maputo, BHP Billiton, Mozambique (2000-2001)**

Project Manager and integrative writer for this ESIA. The EIA included an assessment of the expansion of the port terminal at the Port of Matola and a review of the Phase 2 expansion of the aluminium smelter. All reports together with the EIA process were reviewed and approved by the International Finance Corporation (IFC).

## **Scoping Phase of the Environmental Impact Assessment for the expansion of the Container Terminal at the Port of Cape Town, Portnet, South Africa (2000)**

Project Manager for the EIA for the expansion of the container terminal at the Port of Cape Town. The project included the dredging of 1 million m3 dredge material to provide fill for the expansion of the port. Specialist studies that were required included coastal dynamic modelling, hydrodynamic modelling to assess water quality issues associated with dredging, marine archaeological issues, marine ecology issues, traffic, visual and noise.

## **Strategic Integrated Port Planning, Port of Saldanha, Transnet (1998)**

Project Manager for the Strategic Integrated Port Planning process for the Port of Saldanha. The process culminated in the first Port Development Framework for the Port of Saldanha which integrated environmental and social issues into the port planning process. It included the identification and inclusion of environmental and social opportunities and constraints into the future port planning and development.

## **Environmental Impact Assessment for the PPC Slag Grinding Mill within the Saldanha Steel Complex, PPC (1998)**

Project Manager for the EIA for PPC slag grinding mill. The EIA included a number of specialist studies and comprehensive stakeholder engagement.

## **Memberships and Associations**

- CEAPSA - Registered as an Environmental Assessment Practitioner with the Environmental Assessment Practitioners Association of South Africa (EAPASA)
- IAIAAsa - Member of the International Association for Impact Assessment South Africa
- IAIA International - Member of the International Association for Impact Assessment

## Publications

- Sep 2007: Co-author of case study for IIEDs 'User Guide' to effective tools and methods for integrating environment and development. South African case study: Role of environmental and social screening in informing the conceptual design and planning of large-scale projects in the pre-feasibility
- Aug 2003: Author of a case study on the SEA for the Port of Cape Town, contained in "The Status and Potential of Strategic Environmental Assessment" by Barry Dalal-Clayton and Barry Saddler, DRAFT 17 September 2003.
- March 2002: Strategic Integrated Port Planning: Moving from EIA to SEA. International Conference on Coastal Zone Management and Development, Kuwait 18 to 20 March 2002.
- Nov 2000: Sustainable Port Development: Report on the preparatory seminar for Africa. 7th International Conference of the International Association for Cities and Ports, Marseilles – France.
- Mar 2000: The development of Strategic Environmental Assessment in South Africa: Journal of Impact Assessment and Project Appraisal, Vol 18, Number 3, pg 217-223. September 2000.
- April 1999: Integrating environmental opportunities and constraints into Port Planning, Development and Operation. 5th International Conference on Coastal and Port Engineering in Developing Countries, Cape Town, 19 to 23 April 1999.

### Certification:

I, the undersigned, certify that to the best of my knowledge and belief, these data correctly describe me, my qualifications, and experience.

**Date: 31.05.2023**

A handwritten signature in black ink, appearing to read 'Stuart Heather-Clark'.

Full name of consultant: Stuart Heather-Clark

## **Environmental and Social Management Plan Project Team**





Bjorn Hoffmann has over 16 years' experience in the field of Environmental Management, encompassing both developmental and operational phases on projects. He has gained significant experience in managing environmental compliance on large-scale infrastructure projects. He has experience in *inter alia*: ports, airports, energy (solar, hydro-electric, coal, gas-energy, green ammonia/ hydrogen), light industry, manufacturing, linear developments (road, rail and pipelines (fuel & water)), agriculture, housing development, food and beverage, wastewater treatment, dams, mixed-use development and mining.

Bjorn also has gained international experience undertaking various Environmental & Social (E&S) Due Diligence assignments, including in mergers and acquisitions. He has also been able to support international assignments as a Lender's E&S Advisor undertaking monitoring of construction projects according to lender standards.

He is an internationally registered Environmental Auditor (with the UK-based IEMA) and is also a Professional Natural Scientist (Pr.Sci.Nat.) in Environmental Science.

Bjorn's background, which includes working as a Contractor, allows him to bring a balanced and solution-orientated approach to the monitoring of compliance on site.

## Education

- BSc Honours Environmental Science, University of KwaZulu-Natal (2008)
- BSc Geography and Environmental Management, University of KwaZulu-Natal (2007)

## Project Experience

### Renewable and Non-Renewable Energy

#### **EHS Specialist – Environmental & Social Due Diligence for Norfund Investment in Mulilo (July 2025 – September 2025)**

Client was considering investing in Mulilo. The project was an ESDD (and associated ESAP) for the renewable energy assets including wind, solar (PV) and battery energy storage systems (BESS), enabled for the identification of potential risks in accordance with *inter alia* the Equator Principles IV, GIIP and IFC E&S PSs (i.e. PS 1 – 8). Bjorn was the EHS Specialist assigned to the project, with a focus on PS1, PS2 and PS3. The work conducted included a document review, site inspection, Environmental Due Diligence Compliance Assessment and report was produced. Outcome was a successful investment of Norfund in Mulilo.

#### **ECO Technical Lead – Samancor Solar 100 MW PV, Limpopo South Africa (October 2024 – June 2025)\*\***

Client was constructing a solar PV plant at the Tubatse Ferrochrome near Steelpoort in Limpopo, South Africa. Bjorn was responsible for managing the duties of the ECO who was tasked with undertaking supervision of site establishment, contractor method statement reviews, site audits, attending site progress meetings and reporting to the relevant environmental competent authority.

#### **Environmental Expert – Environmental & Social Due Diligence for Green Ammonia, Eastern Cape South Africa (September 2024 – December 2024)\*\***

Client was considering cooperating with the Project Sponsor and investing in developing the Coega Green Ammonia Project. The Project covers the whole supply chain, from a decentralised renewable energy production (3.5 GW in solar and wind) and green hydrogen production facility (1 120 MW) to a downstream derivative process to produce green ammonia (1 mtpa). The project was an ESDD for the production facility and transport

components (only), enabled for the identification of potential risks in accordance with the GIIP and IFC E&S PSs (i.e. PS 1 – 8). Bjorn was the Environmental Expert assigned to the project. The work conducted included a document review, site inspection, Environmental Due Diligence Compliance Assessment and report was produced.

## **Lead Environmental Auditor – Bokpoort CSP, Northern Cape South Africa (November 2018 – January 2024)\*\***

ACWA Power appointed a consultant to undertake operational compliance audits for the entire Bokpoort CSP (75MW). The assignment was an external audit of all environmental approvals including the EAs (and associated EMPs), Waste Management Licence (WML), Water Use Licence (WUL) and other relevant permits. The work conducted included a review of previous audits undertaken, review and where required, update of existing audit protocol and audit checklist in line with the relevant Environmental Approvals and applicable legislation for the different projects. Also conducting site audits and preparation of audit reports for client records which included quantitative scoring to track progress; and submission of the required Audit Reports to the relevant environmental competent authorities (in this instance the National Environmental Department and also Department of Water & Sanitation). Note: Bjorn was also previously the ECO during construction (from February 2012 – February 2016).

## **Lead Environmental Auditor – Eskom Ingula Pumped Storage Scheme, Free State and KwaZulu-Natal South Africa (2018 – 2021)\*\***

Project was to undertake quarterly operational compliance audits for the entire Ingula Pumped Storage Scheme (IPSS) precinct for a period of three (3) years. Bjorn conducted a detailed compliance audit of the IPSS against all conditions of the EA/ RoD, Operational Environmental Management Programme (OEMPr), Rehabilitation Management Plan (RMP) and WUL. He prepared audit reports for client records which included quantitative scoring to track progress; and submission of the required Audit Reports to the relevant environmental competent authorities.

## **ECO Technical Lead – Waterloo 75MW Solar PV Park and Bokamoso 68MW Solar PV Park, North-west South Africa (2018 – 2020)\*\***

African Clean Energy Developments (through relevant project companies) was constructing two (2) solar PV parks. Bjorn was responsible for managing the duties of the ECO who was tasked with undertaking supervision of site establishment, contractor method statement reviews, site audits, attending site progress meetings and reporting to the relevant environmental competent authority.

## **Environmental Auditor – Eskom Medupi Coal Fired Power Station, Limpopo South Africa (2016)\*\***

Project was to undertake bi-annual external Record of Decisions (RoDs) and Construction Environmental Management Plan (CEMP) compliance audits. Bjorn was one of the Environmental Auditors assigned to the project. He prepared audit reports for client records which included quantitative scoring to track progress; and submission of the required Audit Reports to the relevant environmental competent authorities.

## **Oil and Gas**

### **EHS Specialist – Environmental, Health & Safety (EHS) Due Diligence for Refining Assets, South Africa (March 2026 – May 2026)**

The project was an EHS Due Diligence for a Client who was considering investment in a stake in refining assets in South Africa. Bjorn was the EHS Expert assigned to the project,

with a particular focus on environmental permitting and IFC PS2. The work conducted included document review, site inspections and “red flag” reporting.

## **EHS Specialist – E&S monitoring as Lender’s Advisor – Temane Gas Fired Power Plant, Mozambique (April 2022 – June 2025)\*\***

Bjorn formed part of the Lender’s E&S Advisory Team to undertake the E&S monitoring during construction. Lender was the International Finance Corporation (IFC) while the Project Sponsor was Globeleq. Bjorn was the HSE and Environmental expert assigned to the project. The work conducted included site monitoring visits to ensure conformance to the IFC PSs, with a particular focus on PS1, PS2, PS3 and PS4 (together with Social Specialist).

## **Environmental Expert – Environmental and HSE Permits and Licenses Due Diligence for Acquisition of Petrochemical Downstream Assets, South Africa (September 2024 – December 2024)\*\***

Project was to conduct an Environmental and HSE Permits and Licenses due diligence assessment of the downstream fuel, lubricant and retailing business of an entity in South Africa. Bjorn was the Environmental Expert assigned to the project. The work conducted included a document review, site inspection, interim report and then Environmental Due Diligence Compliance Assessment and report was produced.

## **New Multi-Product Pipeline (NMPP) Project, Durban to Heidelberg (554kms Trunkline & Inland Lines), South Africa (September 2009 – March 2012)\*\***

Transnet constructed the NMPP project consisting of 24” Multi Product Pipeline from Heidelberg – Durban (Total length 554kms) and Inland Lines. Bjorn fulfilled various roles for the Contractor, namely Group Five Civil Engineering – such as: Environmental Manager, Environmental Engineer and Environmental Officer. Bjorn was responsible for planning and direct the implementation of the EMS, coordinating and overseeing all Environmental Engineers, Environmental Officers and Environmental teams, ensuring that all the construction procedures and method statements comply with the environmental requirements in the EMP and environmental motivations for route changes / deviations of the pipeline (among others).

## **Infrastructure: Water and Wastewater**

### **Lesotho Highlands Water Project (Phase 2) Interim SHEQ Audit Team, Lesotho (April – June 2025)\*\***

The Project Management Unit (PMU) appointed Bjorn to serve as the Lead Environmental Auditor as part of the Interim SHEQ Audit Team. The audit included both the Main Dam and Tunnel work packages. The work conducted included a document review, site audit and reporting on compliance to policies, protocols, plans, project approvals (RODs and CEMPs) and environmental specifications.

### **uMngeni-uThukela Water Environmental Site Assessment and development of EMPs, KwaZulu-Natal South Africa (March – June 2025)\*\***

Bjorn was approached by the Minekhaya Group to assist with a due diligence of ten (10) wastewater treatment works and a pump station within the eThekweni municipality, Durban South Africa. Bjorn was the Environmental Expert assigned to the project. The work conducted included a document review, site inspections, interim reporting and then Environmental Due Diligence Compliance Assessment and report was produced. The project was intended to lead to the development of site specific OEMPs for the wastewater treatment works and a generic OEMP for the pump stations.

## **ECO Technical Lead – Southern Wastewater Treatment Works, KwaZulu-Natal South Africa (2017 – 2020)\*\***

The eThekweni Municipality Water & Sanitation Department (EWS) was undertaking upgrades to the WWTW and associated sea outfall pipeline. Bjorn was responsible for managing the duties of the ECO who was tasked with undertaking supervision of site establishment, contractor method statement reviews, site audits, attending site progress meetings and reporting to the relevant environmental competent authority.

## **Environmental Auditor – Fishwater Flats Wastewater Treatment Works, Eastern Cape South Africa (2018)\*\***

Project was to undertake an external compliance audit of the Waste Management Licence (WML) for the Fishwater Flats Wastewater Treatment Works. Bjorn conducted a detailed compliance audit against all conditions of the WML. He prepared an audit report for client records which included quantitative scoring to track progress.

### **Infrastructure: Ports**

## **Environmental & Social Due Diligence for the Safaga Port Terminal, Egypt (February 2024 – January 2025)\*\***

Bjorn formed part of the Lender's E&S Advisory Team to undertake an ESDD. Lender was the International Finance Corporation (IFC) while the Project Sponsor was the AD Ports Group. Bjorn was the HSE and Environmental expert assigned to the project. The work conducted included a review of the project against the IFC PSs, with a particular focus on PS1, PS2, PS3, PS4 (together with Social Specialist) and PS6 (with input from Biodiversity Specialist).

## **Environmental Due Diligence (including Decarbonisation) for Port Container Terminal, Thailand (September 2023 – November 2023)\*\***

The project was a Technical Due Diligence (including Environmental) at the Laem Chabang Port container terminal in Thailand. Bjorn was the Environmental Expert assigned to the project. The work conducted included a document review, site inspection, Environmental Due Diligence Compliance Assessment and report was produced.

## **EHS Due Diligence for Port Container Terminals, Eastern Cape and KwaZulu-Natal South Africa (September 2022 – December 2022)\*\***

The project was an HSE due diligence for the Durban and Ngqura Port Container Terminal locations in South Africa. This was done in support of a key client that was bidding as part of Transnet's Private Sector Participation (PSP) project. Bjorn was the Environmental Expert assigned to the project. The work conducted included a document review, site inspection, Environmental Due Diligence Compliance Assessment and report was produced for the Durban Container Terminal site (only).

### **Infrastructure: Airports**

## **Environmental Due Diligence for Airport in Southern Africa (October 2024 – January 2025)\*\***

The project was a Technical Due Diligence (including Environmental) at an airport in Southern Africa. Bjorn was the Environmental Expert assigned to the project. The work conducted included a document review, site inspection, Environmental Due Diligence Compliance Assessment and report was produced.

## **Independent Legal Compliance Audit Team at the King Shaka International Airport, KwaZulu-Natal South Africa (2017 – 2019)\*\***

ACSA appointed a Consultant to provide an independent legal compliance audit team for environmental auditing at the King Shaka International Airport for a period of two (2) years. Bjorn was the Environmental Auditor assigned to the project. The audit team was required to audit compliance against all relevant legislative requirements. He prepared audit reports for

client records which included quantitative scoring to track progress; and submission of the required Audit Reports to the relevant environmental competent authorities.

## **Environmental Control Officer, Pietermaritzburg Airport Apron & Terminal Reconfiguration, KwaZulu-Natal South Africa (2013 – 2014)\*\***

Project was the reconfiguration of the PMB Airport Apron and Terminals including construction and rehabilitation phases. Bjorn was the ECO assigned to the project. He ensured the EMPr was implemented on site. He also developed the audit checklist, undertook audits, reported back to management on Contractor performance on site, compiled ECO Reports, reviewed Complaints Register and undertook Environmental Close-out Audit and Reporting.

## **Infrastructure: Linear Developments**

### **Environmental & Social Due Diligence for the Lobito Railway Rehabilitation, Angola (December 2024 – March 2025)\*\***

Bjorn formed part of the Lender's E&S Advisory Team to update an ESDD (review actions taken to address the outcomes of the ESDD including addressing the ESAP). Lender was the Development Finance Corporation (DFC). Bjorn was the HSE and Environmental expert assigned to the project. The work conducted included a review of the project against the IFC PSs, with a particular focus on PS1, PS2, PS3, and PS4 (together with Social Specialist).

### **ECO Technical Lead – numerous KZN DOT roads and bridges, KwaZulu-Natal South Africa (2013 – 2025)\*\***

Projects included: Pongola River Bridge (Mboza), Tugela River Bridge (Tugela Ferry), P6-5 Rehabilitation, P291 Rehabilitation, P47-3 Rehabilitation, P449 Road Upgrade, D1886 Road Upgrade, Bhudlu Access Bridge & Link Road, Upgrade of the P230, P237 Intersection & Pedestrian Walkway, D9 Road Upgrade, P318 Sani Pass (Phase 2) [interim only], P577 Bus Lanes, D130 Road Infrastructure Upgrade, and Mkuze Bridge. Bjorn was responsible for ECO duties or else managing the duties of the ECO who was tasked with undertaking supervision of site establishment, contractor method statement reviews, site audits, attending site progress meetings and reporting to the relevant environmental competent authority.

### **Sibaya Precinct Roads (Node 5) Environmental Control Officer, KwaZulu-Natal South Africa (2021 – 2024)\*\***

Project was to undertake the ECO duties for the construction and rehabilitation phases of the Sibaya Precinct (Node 5) road project, Durban, South Africa on behalf of Tongaat Hulett Developments. Bjorn was responsible for managing the duties of the ECO who was tasked with supervision of site establishment, reviewing contractor method statements, site audits, attending site progress meetings and reporting to the relevant environmental competent authority.

### **Sibaya Precinct Pipelines (Node 1) Environmental Control Officer, KwaZulu-Natal South Africa (October 2016 – December 2017)\*\***

Project was to undertake the ECO duties for the construction and rehabilitation phases of the Sibaya Precinct (Node 1) Steel Bulk Water Main and Bulk Sewer Connection project, Durban, South Africa on behalf of Tongaat Hulett Developments. Bjorn was tasked with supervision of site establishment, reviewing contractor method statements, site audits, attending site progress meetings and reporting to the relevant environmental competent authority.

## **Infrastructure: Industry (Heavy and Light), Food & Beverage, Manufacturing, Healthcare**

### **Biovac ESMP and E&S Monitoring (2026)**

SLR was appointed by The Biovac Institute (Pty) Ltd to undertake an Environmental and Social Impact Assessment (ESIA) and develop an ESMP in accordance with the

requirements of the IFC, EIB and the AfDB for the proposed vaccine manufacturing facility and associated infrastructure. Bjorn was responsible for technical review of the Environmental & Social Management Plans (ESMPs) for the civils, construction and operational phases. He is also presently the Project Director for the E&S monitoring being undertaken during construction implementation.

## **ZEDA / AVIS Budget Environmental Audits of Underground Storage Tanks (USTs), various locations South Africa (2025)**

Bjorn was the Project Director for the audit of USTs at eleven (11) AVIS locations across South Africa. The appointment included the development of an Operational Environmental Management Programme (OEMPr) for all AVIS sites, and also a Standard Operating Procedure (SOP) for the decanting of fuel.

## **EHS Due Diligence for refractory manufacturer, United States of America (November 2023 – January 2024)\*\***

Project was an EHS Due Diligence for the acquisition of a refractory manufacturer based in the United States of America (with affiliates in two other locations). Bjorn was the Environmental Expert assigned to the project. The work conducted included a desktop document review (only) leading to an Environmental Due Diligence Compliance Assessment and report.

## **EHS Due Diligence for the post acquisition of LF Logistics (in 11 countries in South-East Asia) (February 2023 – May 2023)\*\***

Project was an EHS Due Diligence for the post acquisition of LF Logistics in 11 countries in South-East Asia, including the *Philippines, Malaysia, Singapore, Thailand, Japan*, India, South Korea, Vietnam, Indonesia, Taiwan and Australia. Bjorn coordinated and was the Environmental Expert across 10 of 20 sites (in 5 of the 11 countries including those in italics above), where he undertook the site visits together with local partners. Bjorn consolidated the full Due Diligence EHS Compliance Assessment and report.

## **Technical and EHS Due Diligence for Cold Storage locations, Southern Africa (two countries) (March 2022 – June 2022)\*\***

Project was a Technical and HSE due diligence for eight (8) Cold Storage locations in Southern Africa. Bjorn was the Environmental Expert assigned to the project. The work conducted included a document review, site inspection, Environmental Due Diligence Compliance Assessment and report was produced.

## **Technical and Environmental Vendor Due Diligence for Pharmaceutical location, Western Cape South Africa (September 2021 – November 2021)\*\***

Project was a Technical and Environmental Vendor Due Diligence for Pharmaceutical locations in the Netherlands and South Africa. Bjorn was the Environmental Expert assigned to the South African project location. The work conducted included a document review, site inspection, Vendor Due Diligence EHS Compliance Assessment and report was produced.

## **HSE Due Diligence for Dry Port locations, South Africa (April 2021 – June 2021)\*\***

Project was an HSE due diligence for seventeen (17) Dry Port locations across South Africa. Bjorn was the Environmental Expert assigned to the project. The work conducted included a document review, site inspection, Environmental Due Diligence Compliance Assessment and report was produced.

## **ECO Technical Lead – Ikusasa project for Kerry Foods, KwaZulu-Natal South Africa (2019 – 2021)\*\***

Client was constructing a new facility. Bjorn was responsible for managing the duties of the ECO who was tasked with undertaking supervision of site establishment, contractor method

statement reviews, site audits, attending site progress meetings and reporting to the relevant environmental competent authority.

## **ECO Technical Lead – Northfield Business Park (within the Rohill Business Estate), KwaZulu-Natal South Africa (2017 – 2024)\*\***

JT Ross was constructing the Northfield Business Park. Bjorn was responsible for managing the duties of the ECO who was tasked with undertaking supervision of site establishment, contractor method statement reviews, site audits, attending site progress meetings and reporting to the relevant environmental competent authority. Once construction was completed Bjorn also supervised the Environmental Auditor for the operational compliance audits that followed.

## **ECO Technical Lead – Cornubia Ridge Logistics Park, KwaZulu-Natal South Africa (2017 – 2025)\*\***

Fortress Income was constructing the Cornubia Ridge Logistics Park within Cornubia Phase 2. Bjorn was responsible for managing the duties of the ECO who was tasked with undertaking supervision of site establishment, contractor method statement reviews, site audits, attending site progress meetings and reporting to the relevant environmental competent authority.

## **Environmental Auditor for Dube TradePort Corporation Site-Wide Precinct, AgriZone, Watson Highway Link Road and Waste Storage Sites, KwaZulu-Natal South Africa (2016 – 2018)\*\***

Project was to undertake operational compliance audits for the entire Dube TradePort Site Wide precinct, AgriZone precinct, Watson Highway Link Road and the Waste Storage Sites. He prepared audit reports for client records which included quantitative scoring to track progress; and submission of the required Audit Reports to the relevant environmental competent authorities.

## **Millennium Challenge Account Lesotho (MCA-L) Health Clinic Construction ECO, Lesotho (March 2012 – May 2013)\*\***

Project was the design, renovation, re-configuration, expansion and construction to fully functional, hygienic and structurally fit for purpose 102 health centres throughout the Kingdom of Lesotho. Bjorn was appointed as the Contractor's E&S Manager for the project. He successfully turned around a project that was failing to deal with a number of environmental issues, including social awareness training of site staff (Trafficking in Persons and HIV/AIDS), and the management of Hazardous and Asbestos Containing Materials (H&ACMs) and Legacy Medical Waste. Bjorn ensured that all the project procedures and method statements complied with the requirements of the EMP, the Client (MCA-L) and Funder (MCC), as well as managed scheduled external audits and undertook inspections on Contractor's performance on site and reported back to project management.

## **Mining**

### **Northbound Mine Water Use Licence Application (construction method statement), Gauteng South Africa (2025)**

Assisted with the Construction Method Statement (CMS) in support of the Northbound Processing Knights Germiston Facility Water Use Licence Application.

## **Infrastructure: Mixed Land-Use**

### **Greater Cornubia Development, KwaZulu-Natal South Africa (2013 – 2025)\*\***

The Greater Cornubia Development included a number of phases included Phase 1, Retail Park and M41 Interchange, Phase 2, Cornubia Bridge and MR79 Bridge Upgrade. Bjorn acted as the ECO and ECO Technical Lead on all these phases under Tongaat Hulett Developments. Duties included undertaking supervision of site establishment, contractor

method statement reviews, site audits, attending site progress meetings and reporting to the relevant environmental competent authority.

## Environmental Incident Investigations

### **UPL Environmental Incident – Forensic-level Investigation, KwaZulu-Natal South Africa (2021 – 2025)\*\***

Confidential. Bjorn managed and coordinated a team of specialists to undertake a forensic-level investigation on the impact of the UPL environmental incident for Fortress Income. Bjorn continued consulting and providing site monitoring once the investigation was concluded.

### **Southern Wastewater Treatment Works – Sea Outfall Pipeline Section 30, KwaZulu-Natal South Africa (2019)\*\***

Bjorn was tasked with undertaking the compilation and submission of the Section 30 related to a leak of the Sea Outfall Pipeline. This also included supervision during repair works and community notifications.

### **Mphopomeni Wastewater Treatment Works – Asbestos, KwaZulu-Natal South Africa (2019)\*\***

Bjorn was tasked assisting the project to manage potential risks in terms of exposure related to Asbestos Containing Materials (ACMs).

## Memberships and Associations

- ISEP (formerly IEMA) – Registered as an Environmental Auditor with the Institute of Environmental Management and Assessment (based in the UK)
- SACNASP - Registered as a Professional Natural Scientist in the field of Environmental Science with the South African Council for Natural Scientific Professions

## Additional Training

- 2018 Environmental Management System – Lead Auditor, North-West University
- 2018 Environmental Management System Transition, North-West University
- 2017 Environmental Law, North-West University
- 2015 Implementing Environmental Management Systems (ISO14001), North-West University

## **Specialist Project Team**





Nontethelelo Dlamini has 4 years working experience in Environmental and Social Consultancy Sector across South Africa and Southern Africa. Her expertise include compiling Environmental and Social Impact Assessments (EIA/ESIA), Environmental and Social Management Plans (ESMPs), Environmental compliance and monitoring, development of socio-economic baselines, planning and implementation of Resettlement Action Plans (RAP) and Livelihood Restoration Plans (LRP) as well as undertaking Stakeholder Engagement.

Nontethelelo has a sound working knowledge of legal national and international requirements as well as good international industry practice. She has worked on local and international projects across a variety of sectors including mining, infrastructure, green hydrogen, renewable energy, oil and gas. Majority of these projects were undertaken in accordance with international safeguard standards including the IFC Performance Standards, World Bank ESF and Equator Principles.

Beyond her consultancy skills, Nontethelelo has demonstrated exceptional achievements in various professional domains. Notably, in May 2025, she presented on 'Challenges of integrating Resettlement and Livelihood Restoration in mining-induced development projects' at the International Association for Impact Assessment (IAIA) 44<sup>th</sup> Annual conference in Bologna, Italy. She has also acquired excellent leadership skills by supervising local enumerators during a resettlement study project, where she played a pivotal role in guiding the team and ensuring the project's success. These accomplishments highlight her strong passion for understanding the importance of implementing sustainable practices to mitigate environmental impacts and promote long-term environmental, social, and economic stewardship.

## Education

- BSS Geography and Environmental Management (University of KwaZulu-Natal), 2020
- BA Hons Economic History (University of KwaZulu-Natal), 2021
- MA Geography and Environmental Studies (Stellenbosch University), ongoing

## Selected Project Experience

### Roam Renewable Energy (2025)

Social Impact Assessment for the proposed 400 MW Wind Energy Facility, Prince Albert Local Municipality, Western Cape Province, South Africa.

### Osino Gold Exploration and Mining (Pty) Ltd (2025)

Social Impact Assessment for the proposed construction of a surface and storage water dam on the Khan River to supply operational demand of the proposed conventional open pit gold mine, Erongo Region, Namibia.

### CWP H1 Energy Pte. Ltd (2025)

Social Impact Assessment undertaken in accordance with IFC performance standards and lender requirements for proposed development and operation a 600 MW Green Hydrogen and Amonia Production Plant at the Terminal Oceânico da Barra do Dande (TOBD), Luanda, Angola.

### Khathu Solar Park (Pty) Ltd (2025)

Social Impact Assessment undertaken in accordance with the IFC standards for a 10 MW Solar Photovoltaic (PV) augmentation facility to supplement an existing Concentrated Solar Power (CSP) facility, Gamagara Local Municipality, Northern Cape

Province, South Africa.

## **TotalEnergies EP South Africa S.A.S (2025)**

Socio-economic Impact Assessment for two-dimensional and three-dimensional seismic survey activities over Blocks DWOB and 3B/4B, West Coast, Western Cape Province, South Africa.

## **TotalEnergies EP South Africa S.A.S (2025)**

Socio-economic Impact Assessment for drilling of seven exploration wells including Vertical Seismic Profiling, well testing operations, plugging and abandonment of the wells on the seafloor in the southern portion of Block DWOB off the West Coast of South Africa.

## **Main Street 1549 (Pty) Ltd (2025)**

Coordinating the public participation process for proposed bathymetry, sonar, sea floor sampling and Remotely Operated Vehicle (ROV) survey activities in Block 9 and 11B/12B off the South Coast of South Africa.

## **Globeleq (2024)**

Census surveys and Livelihood Restoration Planning (LRP) undertaken in accordance with the IFC Standards and lender requirements for affected land users within the transmission line corridor of the proposed construction of a 32-meter-wide transmission line in Kafue, Lusaka Province, Zambia.

## **TotalEnergies Renewable (2024)**

Social Impact Assessment undertaken in accordance IFC Performance Standards and World Bank Environmental and Social Framework (ESF) for the Paarde Valley PV2 (120 MW) Solar Energy Facility, the De Aar South Wind Energy Facility (140 MW) and the Wag 'n Bietjie MTS Substation, eMthanjeni Local Municipality and Renosterberg Local Municipality, Northern Cape Province, South Africa.

## **KfW Development Bank on behalf of Electricidade de Mocambique E.P (2024)**

Social Impact Assessment and Social Management Plan (SMP) in accordance with the KfW Bankengruppe and World Bank Environmental and Social Standards (ESS) for retrofitting a 220 kV High Voltage (HV) transmission line from Matambo to Chibata (320km) using an Optical Ground Wire (OPGW), Tete Province, Mozambique.

## **Veroniva Renewable Energy (2024)**

Social Impact Assessment for the Biesjesvlei Solar PV1, PV2 and PV3 and associated infrastructure including a Battery Energy Storage Systems (BESS) and a 132kV Overhead Powerline (OHL) in Mohokare Local Municipality, Free State Province, South Africa.

## **Moyi Power (2024)**

Resettlement Action Plan (RAP) and Livelihood Restoration Plan (LRP) for a proposed hybrid power hybrid power generation facility, which includes an 8.5 MW solar PV power plant, 25.5 MWh Battery Energy Storage Systems and 2.8 MW diesel gensets in the Sud Ubangi; Mongala and Haut-Uele Provinces, Democratic Republic of Congo.

## **Shell Offshore Upstream South Africa (Pty) Ltd (2024)**

Socio-economic Impact Assessment for proposed well drilling exploration activities to confirm and test the presence and quality of hydrocarbon on the License Block Northern Cape Ultra-Deep off the West Coast of South Africa.

## **Zutari (2023)**

Stakeholder Engagement Planning and an Indigenous Peoples Plan in accordance with Free,

Prior, and Informed Consent (FPIC) requirements, ensuring alignment with International Finance Corporation (IFC) standards for a proposed transmission interconnection project to increase power transfers within the Southern African Power Pool (SAPP) network and to increase the stability in the power pool, Angola and Namibia.

## **Tharisa Minerals (Pty) Ltd (2022)**

Resettlement Action Plan (RAP) and Livelihood Restoration Plan (LRP) in accordance with IFC standards. Nontethelelo was the field survey supervisor to local enumerators and responsible for management of primary data collection for the resettlement study, Mahikeng Local Municipality, North-West Province.

## **Mafube Colliery (2022)**

Livelihood restoration and grave relocation processes post-resettlement of households due to expansion of mining activities in accordance with IFC standards, Steve Tshwete Local Municipality, Mpumalanga Province, South Africa.

## **Blyvooruitzicht Gold Mine Pty (Ltd) (2022)**

Social Impact Assessment the proposed 200 MW Solar PV to supply power to the existing open pot gold mine, Merafong City Local Municipality, Gauteng Province, South Africa.

## **Anglo-American Platinum (Mogalakwena) (2022)**

Resettlement Action Plan (RAP) and Livelihood Restoration Plan (LRP) in accordance with IFC standards. Nontethelelo was the field survey supervisor to local enumerators and responsible for management of primary data collection for the resettlement study, Giyani Local Municipality, Limpopo Province, South Africa.

## Memberships and Associations

- IAIAsa (Membership No.: 7493)
- IAP2sa (Membership No.: IAP2SA045)

## Additional Training

- Level 1 First Aid Training
- Higher Certificate in Project Management Foundations (University of Cape Town), 2023

## Certification:

I, the undersigned, certify that to the best of my knowledge and belief, these data describe me, my qualification and experience

A handwritten signature in black ink, appearing to read 'Nontethelelo Dlamini'.

**Full name of consultant: Nontethelelo Siyabulela Dlamini**

## Overview

Robert has broad technical expertise in carbon accounting, physical climate risk assessments, transition risk assessments, Paris alignment workflows, and can provide high-level ESG advice for mining, agricultural, pharmaceutical, IT, waste management, renewables, and industrial sectors.

He previously worked as an intern ESG analyst at IBIS consulting, where he garnered exposure to the social team, the impact investing team, the ESDD performance team, and the climate team.

Robert also has extensive experience in waste management and landfill design, life cycle assessments, and AI modelling, having assisted develop an app that automatically identifies and quantifies plastic waste in the riverine environment.

## Education

- Bachelor of Science, Stellenbosch University (2020)
- Bachelor of Science (Hons), Stellenbosch University (2021)
- Master of Science (Civil Engineering), University of KwaZulu-Natal (2024)

## Project Experience

### Mining

#### Rare Earth Minerals Mine – Mongolia (2025)

Preparation of the climate section of an ESIA regarding a rare earth minerals mine in Mongolia.

#### Copper Mine – Zambia (2025)

Drafting the physical and transition risk, and Paris alignment sections of an ESDD regarding the expansion of a copper mine's overarching operations in Zambia. Moreover, Robert was involved in the carbon accounting process of this Project, assisting to develop a Scope 2 and 3 GHG emissions calculator tool for the Client, as well as their upstream and downstream value chain.

#### PGM Mine – South Africa (2022) \*\*

ESDD and red flag auditing and report drafting regarding the derivation of capital for project expansion of a PGM mine in South Africa

### Pharmaceuticals

#### Pharmaceutical Manufacturing – Egypt (2025)

Drafting the physical risk assessment facet of the ESDD for a pharmaceutical manufacturing facility in Egypt's 10<sup>th</sup> of Ramadan city. In this regard, Robert also assisted in preparing the ESDD's ESAP and assessed the Client's adherence to the IFC's PS3.

#### Ophthalmic Manufacturing – Egypt (2025)

Drafting the physical and transition risk assessment ESDD sections for a pharmaceutical company specialising in the ophthalmic segment. Additionally, Robert also assisted in compiling the project's ESAP.

#### Agricultural Vaccine Manufacturing – South Africa (2022) \*\*

Developing an ESMS for an agricultural animal vaccination producer in South Africa. In this regard, Robert also assisted in drafting the ESDD and red flag reports for the Client. Moreover,

Robert contributed to preparing the client workshop presenting the new management system to the Client.

## Agricultural

### Spice Manufacturing – Africa (2025)

Drafting the transition risk and Paris alignment pieces of the ESDD for a spice manufacturer whose operations span Tanzania and Nigeria. In this regard, Robert also provided input regarding the physical climate risk assessment.

### Canned Fruit Manufacturing – South Africa (2025)

Developed a high-level physical risk assessment and guidance note for a canned fruit manufacturer in the Western Cape, South Africa. In this regard, a climate-based value chain assessment was conducted, and resilience recommendations presented for the Client.

## Renewables

### Wind Energy Facility – South Africa (2025)

Drafting the climate section of the ESIA for a proposed wind facility the Western Cape Province of South Africa. In this regard, Robert also assisted in drafting the biodiversity section of the resultant ESIA.

## IT

### Nature Technology Investment Platform – Americas (2025)

Robert assisted in drafting a Scope 3 emissions guidance note for the Client ensuring their carbon foot printing workflow adhered to the GHG Corporate Protocol Standard.

## Industrial

### Commercial Sign Manufacturer – South Africa \*\*

Drafting an ESDD and red flag report for a sign manufacturing facility in Durban, South Africa. In this regard, Robert drafted the PS3 section of the report, and assisted preparing the project's ESAP.

## Waste Management

### Development of a Waste Management App \*\*

Robert assisted adapt an application that automatically identified and quantified plastic waste emplaced within the riverine environment. The resultant waste stream was subsequently entered into an MCDA model, and output utilized to develop a profitable plastic waste management plan (theoretical) for the eThekweni Municipality.

## Awards

- Golden Key International Honor Society Award (2018)

## Additional Training

- DataCamp course in Python
- DataCamp course in R
- DataCamp course in Power BI
- DataCamp course in SQL



Lisa offers various environmental management services, including atmospheric dispersion modelling; compilation of atmospheric emission inventories and greenhouse gas inventories; nuisance (noise and odour) monitoring, modelling and management; health impact assessments; climate change impact assessments; and strategic air quality management plans.

With a background in meteorology, Lisa has experience using ground-based station, weather balloon, radar and satellite data for interpreting meteorological and atmospheric dispersion contexts. She is skilled in an array of emission inventory tools and dispersion modelling software packages, including TANKS, Water9, LandGEM, ADMS, AERMOD and CALPUFF. She also has experience with downscaled climate models for regional climate change assessments. She has acted as an expert witness

in various fire, storm, wind and hail legal cases.

Lisa has consulting experience across Africa, including in Angola, Egypt, Ethiopia, Ghana, Guinea, Kenya, Mozambique, Namibia, Nigeria, Rwanda, South Africa, Tanzania, Zambia, Zanzibar and Zimbabwe. She also has experience in Europe, Asia, the Middle East and Australia. This includes air quality and health impact assessments to lender standards.

Lisa completed a PhD in 2010 at the University of Cambridge, looking at the political ecology of air pollution and environmental health in Durban, South Africa. She is currently an Associate Professor in the College of Health Sciences, University of KwaZulu-Natal, where she maintains a broad research portfolio and supervises postgraduate students researching air pollution exposure, climate change and health. She has a number of peer-reviewed publications in these fields.

## Education

- Doctor of Philosophy - University of Cambridge (2010)
- Master of Philosophy - University of Cambridge (2006)
- Master of Science - Palaeoclimatology, University of KwaZulu-Natal (2005)
- Bachelor of Science (Hons) - Atmospheric Science, University of Natal (2003)
- Bachelor of Science, University of Natal (2002)

## Project Experience

### Advisory

#### **Environmental and Social Policy Assessment (ESPA), The German Development Bank/Kreditanstalt für Wiederaufbau (KfW) (2022-2023)**

Appointment to compile an ESPA to support KfW's Policy Based Lending (PBL) financing agreement with the Government of South Africa (represented by the Minister of Finance) to provide support to the country's energy reforms for a Just Energy Transition.

## Air Quality Impact Assessment (AQIA)

### MINING

#### **AQIA for Kabanga Mine, Tembo Nickel Corporation Limited, Tanzania (2025)**

Compilation of emissions inventory and atmospheric dispersion modelling assessment of the proposed mining facility to support Environmental and Social Impact (ESIA) update process. Significance assessment of key emission sources, and recommendations for emission mitigation and management.

#### **AQIA for Iduapriem Mine, AngloGold Ashanti, Ghana (2024 – 2025)**

Appointment to develop, install and manage an air quality monitoring network (dust fallout, continuous particulate and gas monitoring) at the Iduapriem mine. The appointment also includes the compilation of an emissions inventory and atmospheric dispersion modelling of the facility.

#### **AQIAs for Rutongo, Nyakabingo and Musha Mines, Trinity Metals, Rwanda (2023)**

Baseline air quality monitoring (continuous particulate and passive gas monitoring) at three mines. Compilation of baseline assessment reports including emission mitigation and air quality management recommendations.

#### **Der Brochen / Mototolo Mining Complex, Anglo American Platinum, Limpopo, South Africa (2022 - 2025)**

Development of emission inventory and atmospheric dispersion model for the facility. Development of Air Quality Monitoring Plan, Air Quality Management Plan and compilation of Anglo Risk Register. Workshops with onsite team.

#### **Mogalakwena Mining Complex, Anglo American Platinum, Limpopo, South Africa (2022 - 2025)**

Development of emission inventory and atmospheric dispersion model for the facility. Development of Air Quality Monitoring Plan, Air Quality Management Plan and compilation of Anglo Risk Register. Workshops with onsite team. Three years of monthly dust fallout monitoring, and management of Polludrone continuous air quality monitoring network.

#### **AQIA for Siguiri Mine, AngloGold Ashanti, Guinea (2012)**

Compilation of an emissions inventory for mining processes and onsite electricity generation using United States Environmental Protection Agency AP42 and Australian National Pollution Inventory emission factors. A Level 2 dispersion model (ADMS) was used to calculate ambient concentrations of particulate matter and dust fallout in the region. Health impact and dust nuisance assessments were conducted for nearby sensitive receptors.

### INFRASTRUCTURE

#### **AQIA for Key Infrastructure Upgrades, Propav Infraestructuras Limited, Zanzibar (2023)**

SLR was appointed to undertake air quality assessment for the proposed upgrade and rehabilitation of three road sections and an airport within the Zanzibar Archipelago. The study included a baseline ambient air quality monitoring survey and a screening level (SCREEN3) dispersion modelling assessment of the construction and operational phases of the proposed project and accounted for potential reductions in current emissions. Impacts were evaluated using IFC EHS guidelines.

### POWER

#### **Advisor to the Minister of Fisheries, Forestry and Environment (2025)**

Appointment to advise the Minister of Fisheries, Forestry and Environment (Dr Dion George) on the technical aspects of the Eskom applications in terms of Section 59 of NEMA:AQA for eight coal-fired power stations.

#### **AQIA for Thabametsi Power Plant, Eskom, Limpopo, South Africa (2019)**

Peer review of the AQIA for Phase 1 (630 MW) of the proposed Thabametse Power Plant to support the AEL application. The study comprised a baseline assessment, emissions inventory, Level 3 (CALPUFF) atmospheric dispersion model and impact assessment. The emissions inventory compiled by the original service provider was updated for input to an atmospheric dispersion model.

**AQIA for Power Generation, Saudi Electricity, Saudi Arabia (2016)**

Peer review of an AQIA to establish whether the study aligned with international best practice and International Finance Corporation (IFC) requirements.

**AQIA for Power Generation, Gigajoule Mozambique, Mozambique (2014 & 2016)**

A Level 2 dispersion model (AERMOD) was run to assess the cumulative ambient impacts of both the natural gas-fired Gigawatt facility and one neighbouring facility. The ambient concentrations were compared with local standards and international guidelines. Recommendations for emissions reduction and ambient air quality improvement were provided. In 2016, a 40 MW expansion scenario was simulated and assessed.

**RENEWABLE ENERGY**

**Specialist air quality opinion for Solar Photovoltaic (PV) Power Generation, Marula Platinum (Pty) Ltd, Limpopo, South Africa (2023)**

Specialist air quality opinion describing potential air quality related risk associated with a proposed PV facility in the context of existing air pollution sources within an existing mining rights area. The opinion motivated against the need for a full AQIA, however provided recommendations for further assessment and management planning should the competent authority require it.

**AQIA for Green Ammonia Production, ENERTRAG South Africa, Mpumalanga, South Africa (2022)**

Specialist impact statement and provisional AEL application for two renewable energy complexes producing green ammonia.

**AQIA for Solar Power Facilities, ACWA Power Energy Africa, Northern Cape, South Africa (2020)**

Compiled an AQIA for 10 x 200 MW photovoltaic facilities in one of South Africa's eight renewable energy development zones. The study comprised a regulatory assessment, baseline air quality assessment, emissions assessment for the construction and operational phases of the project, with consideration of various technology options, and recommendations for minimising air quality impacts during the various phases of the project, including decommissioning.

**AQIA for Solar Power Facility, Brightsource Energy, Northern Cape, South Africa (2014)**

Compilation of an emissions inventory of 125 MW CSP for input to a Tier 2 atmospheric dispersion model (ADMS). Outputs were compared the NAAQS to assess potential impacts associated with operations of the proposed facility.

**WASTE AND WASTEWATER**

**AEL Renewal and Transfer application for Healthcare Risk Waste Incineration, Eastern Cape Incineration Services (Pty) Ltd, Gauteng, South Africa (2023)**

SLR was appointed by Buhle Waste to facilitate the AEL renewal and transfer of ownership application for their newly acquired ECIS facility in Roodepoort, Johannesburg. The process included engagement with both the licensing authority and the National Department of Forestry, Fisheries and the Environment (DFFE). Following a NEM:AQA compliant public participation process, the application was submitted via SAAELIP and successfully issued by City of Joburg (the licensing authority in this case).

**AIR for New England Road Landfill, KZN EDTEA, KwaZulu-Natal, South Africa (2021)**

An AIR was requested by KZN EDTEA following recurring fire incidents at the New England Road Landfill in Pietermaritzburg. The study assessed air quality impacts of the July 2020 fire on nearby receptors and to determine the long-range impact across the greater area. The Level 3 (CALPUFF) dispersion model simulated the effect of local topography and meteorology on the dispersion of over 70 pollutants emitted during the fire event. Ground-level concentrations were compared with relevant national standards and international guidelines.

**AQIA for Wastewater Treatment, Metito Utilities Ltd, Serbia (2021)**

Calculation of emissions from a proposed Wastewater Treatments plant (WWTP) in Zrenjanin, Serbia for input to a Level 2 (AERMOD) atmospheric dispersion model. Potential health impacts of emissions were assessed by comparing simulated ambient concentrations of air pollutants with international guidelines (e.g. those of the World Health Organisation). The study was conducted in line with International Finance Corporation (IFC) requirements.

**AQIA for Wellington Landfill, Drakenstein Municipality, Western Cape, South Africa (2020)**

A specialist AQIA was undertaken for the proposed height increase of the Wellington landfill. This study provided specialist input to the application for a variation of the landfill's Waste Management License (WML). The study comprised a Level 2 (AERMOD) dispersion modelling assessment to predict and assess ground level pollutant concentrations under five proposed height increase scenarios for comparison with relevant NAAQS. Lifetime cancer risk through inhalation exposure to carcinogenic compounds was also assessed.

**AIR for Healthcare Risk Waste Incineration, Compass Medical Waste Services (Pty) Ltd, Gauteng, South Africa (2019)**

Compilation of an AIR and AEL application for Compass Waste's proposed thermal desorption unit in Olifantsfontein. The assessment included a baseline assessment, emissions inventory, dispersion modelling using AERMOD and comparison of the predicted concentrations with national standards. Multiple dispersion scenarios were run to assess the existing air quality scenario (using emissions from neighbouring industries), impacts arising from the proposed development in isolation of surrounding emission sources, and cumulative impacts representative of the post-development situation, as well as a hypothetical stack height assessment to assist with the final engineering design. Lifetime cancer risk through inhalation exposure to carcinogenic compounds was also assessed.

**AIR for Pet Crematoria, Legacy Pet (Pty) Ltd, Gauteng, South Africa (2018)**

An AIR was compiled as part of an environmental authorisation and AEL application for Legacy Pet's proposed pet cremation facility. The assessment included a baseline assessment, emissions inventory, dispersion modelling using AERMOD and comparison of the predicted concentrations with national standards.

**AQIA for Stellenbosch Landfill, Stellenbosch Municipality, Western Cape, South Africa (2014)**

Compilation of an emissions inventory for an existing landfill using the United States Environmental Protection Agency's AP42 emission factors. Emission inventories for three potential end use scenarios were developed, including a gas-to-energy option. A Level 2 dispersion model (AERMOD) was applied to calculate ambient concentrations of key pollutants for a health impact assessment of nearby sensitive receptors under the various scenarios.

**INDUSTRIAL**

**AQIA for Charcoal Manufacturing, E&C Charcoal (Pty) Ltd, KwaZulu-Natal, South Africa (2023)**

An AQIA for an existing charcoal manufacturer near Pietermaritzburg. The study simulated atmospheric emissions from site processes using a Level 3 (CALPUFF) modelling assessment for the comparison of predicted ground-level concentrations with national standards and international guidelines. The study was conducted as part of a NEM:AQA Section 22A license rectification process. Following a NEM:AQA compliant public participation process, the license application was submitted via the South African Atmospheric Emission Licensing Portal (SAELIP).

**AQIA for Primary Aluminium Production, South32 Hillside Aluminium, KwaZulu-Natal, South Africa (2023)**

Appointment to conduct an AQIA assessing atmospheric impacts from a primary aluminium smelter in Richards Bay, with specific focus on Casthouse operations. The study simulated pollutant dispersion using a Level 3 (CALPUFF) modelling assessment and compared impacts from Casthouse emissions with the facility's cumulative impact footprint. The assessment also provided a legal review and professional opinion regarding the applicability of additional NEM:AQA Section 21 listed activities and associated licensing requirements.

**AQIA for Polyurethane Foam Production, Strandfoam Group (Pty) Ltd, Western Cape, South Africa (2022)**

An AQIA and AEL application for Strandfoam Cape's polyurethane foam manufacturing facility in Strand. The study was conducted as part of a NEM:AQA Section 22A license rectification process. The study included the quantification and modelling of relevant pollutants using a Level 2 (AERMOD) dispersion assessment for comparison with national standards and international guidelines. Key emission sources comprised bulk chemical storage, fuel storage, fuel combustion and polyurethane foam production. This assignment required extensive engagement with the licensing authority (City

of Cape Town in this case) including the submission of a specialist opinion on the legal intention of NEM:AQA Section 21 and the potential applicability of license categories outside the ambit of the industrial process in question.

**NAEIS Reporting for Foam Production, Strandfoam Group (Pty) Ltd, Western Cape, South Africa (2021)**

Emissions inventory development for 2020 operations for annual reporting to NAEIS in line with reporting conditions for NEM:AQA Section 21 listed activities. Key emission sources include bulk liquid chemical storage, fuel storage, fuel combustion and polyurethane foam production.

**AIR for Chemical Filling, Richbay Chemicals (Pty) Ltd, Gauteng, South Africa (2020)**

Compilation of an AIR and AEL application for a proposed chemical filling plant. The applicant, Richbay Chemicals, is a manufacturer and exporter of speciality cleaning, maintenance and water treatment chemicals, including hydrochloric acid and sulphuric acid. The study assessed potential impacts to air quality from bulk chemical storage tanks, combustion installations and abatement equipment using a Level 2 (AERMOD) dispersion model. Simulated pollutant concentrations were compared with relevant national standards and international guidelines to assess degree of impact.

**AEL Compliance Reporting for Safripol, Safripol (Pty) Ltd, KwaZulu-Natal, South Africa (2019-2021)**

Contracted to provide AEL compliance support including annual compliance reporting and air quality monitoring obligations stipulated in Safripol's AEL. This comprised emissions inventory development (including emission rate modelling using TANKS), compilation of compliance reports and documents for submission to the online NAEIS and SAAELIP platforms, LDAR surveys, fenceline BTEX monitoring, and odour management planning.

**AQIA for MES postponement for Paper Mill, Mondi, KwaZulu-Natal, South Africa (2019)**

Compilation of a comprehensive emissions inventory of the Richards Bay Mill for various emission scenarios for input to a Level 3 atmospheric dispersion model (CALPUFF). Dispersion model outputs were used to assess changes in air quality impact associated with proposed site developments. Furthermore, the outputs were used to compile an application for the postponement of compliance timeframes of the 2020 Minimum Emission Standards (MES). The MES postponement process required public engagement, including presentations to community stakeholders and written responses to community comments.

**AQIA for Paper Milling, Sappi Saiccor, KwaZulu-Natal, South Africa (2019)**

Compilation of a comprehensive emissions inventory of the Umkomaas Mill for various emission scenarios for input to a Level 3 atmospheric dispersion model (CALPUFF). Dispersion model outputs were used to assess changes in air quality impact associated with proposed site developments.

**NAEIS Reporting for Far Timbers, Far Timbers (Pty) Ltd, KwaZulu-Natal, South Africa (2018, 2019)**

Emissions inventory development for 2017 and 2018 operations for annual reporting to NAEIS in line with license conditions for NEM:AQA Section 21 listed activities. Key emission sources included woodchip stockpiles, biomass combustion in boilers, drying kiln stack emissions and chemical treatment processes.

**AQIA for Nut Processing, Golden Macadamias (Pty) Ltd, Mpumalanga, South Africa (2018)**

A screening level AQIA was conducted for a macadamia nut processing facility to inform the environmental authorisation process for Golden Macadamia's proposed expansion of their existing plant onto an adjacent property. The assessment included a baseline assessment, emissions inventory, dispersion modelling using SCREEN3 and comparison of the predicted concentrations with the national ambient air quality standards.

**AQIA for Lubricant Packaging, Indy Oils (Pty) Ltd, KwaZulu-Natal, South Africa (2017)**

Compilation of an AQIA and AEL application for the proposed expansion of Indy Oil's Pietermaritzburg operations. Key activities included the storage of petroleum-based products in excess of 1000 m<sup>3</sup> as well as the operation of a thermic fluid oil heater. The study included a baseline assessment, emissions inventory, Level 2 dispersion modelling using AERMOD and comparison of predicted concentrations with national standards.

**AQIA for Iron Ore Bulk Terminal, Transnet Port Terminals, Western Cape, South Africa (2015)**

Compilation of an emissions inventory for the iron ore bulk storage facility at Saldanha Bay. A Level 3 atmospheric dispersion model (CALPUFF) was used to calculate ambient concentrations of particulate matter and levels of dust fallout. The study included an assessment of the red staining of surfaces in the nearby suburbs of Vredenburg, Langebaan and Bluewater Bay.

**Emissions Inventory and AEL Application for Chemical Storage Facility, Island View Storage, KwaZulu-Natal, South Africa (2013)**

Compilation of an AEL application for the largest chemical storage facility in South Africa. The study required emission estimation for more than 300 tanks (loading and breathing losses) and for the loading areas (ship and road) using the United States Environmental Protection Agency's AP42 emission factors.

**OIL & GAS**

**Adviser to the National Environmental Consultative and Advisory (NECA) Forum (2024)**

Appointment as an expert advisor to the NECA Forum to advise the Minister of Fisheries, Forestry and Environment (Barbara Creecy) on the technical aspects of two Sasol air emission appeal processes.

**AQIA for Offshore Gas Exploration Drilling, Confidential Client, Namibia (2024)**

Appointment to undertake AQIAs for two proposed exploration and appraisal projects off the coast of southern Namibia. An emissions inventory was developed for fuel combustion (by support vessels and helicopters), electricity generation and flaring of hydrocarbons during well-flow testing. A screening model (SCREEN3) of pollutant dispersion from flaring activities was undertaken to understand worst-case downwind impacts. Impacts were evaluated using IFC EHS guidelines.

**Emissions Inventories for Waste Oil Recycling and Bulk Petroleum Product Storage, FFS Refiners (Pty) Ltd, South Africa (2023, 2024)**

Emissions inventory development for eight FFS petroleum product storage and oil recovery facilities, namely, Teakwood, Pietermaritzburg, Richards Bay, Chloorkop, Evander, Cape Town Harbour and Brackenfell. Evaporative and loading losses were calculated using US EPA TANKS 4.09d and international emission estimation technique guidelines for the bulk storage and handling of products which included an array of base oils and lubricants, fuel oils, chemicals, bitumen, solvents, waste oils, vegetable oils and animal fats. These inventories were submitted to the online National Atmospheric Emissions Inventory System (NAEIS) portal, as part of FFS' annual compliance reporting obligations.

**ESG DD for debt financing of an Oil Mining Lease in Nigeria, Confidential Client (2022).**

**ESG DD for purchase of interest in Angolan offshore oil blocks, Confidential Client (2022).**

**AIR for Refinery Flare Stack Upgrade, SAPREF, KwaZulu-Natal, South Africa (2021)**

An AIR in support of an AEL variation application was undertaken for the proposed increased flare capacity and increased flare stack height at South Africa's largest crude oil refinery, SAPREF. The study assessed four emission scenarios using a Level 3 (CALPUFF) dispersion modelling assessment. Impacts from emergency and planned shutdowns as well as cumulative and long-term scenarios were compared with national standards.

**AIR for Refinery Shutdown and Startup, SAPREF, KwaZulu-Natal, South Africa (2020)**

An AIR of emergency flaring events that occurred during the shutdown and start-up of South Africa's largest crude oil refinery. A Level 3 (CALPUFF) dispersion model was run for peak hourly and 24-hourly emission scenarios. The refinery's contribution to ambient pollutant concentrations measured by three municipal air quality monitoring stations was assessed using wind trajectory analyses.

**NAEIS Reporting for Bulk Storage Facility, NATREF (Pty) Ltd, KwaZulu-Natal, South Africa (2016-2018)**

Emissions inventory development for 2016, 2017 & 2018 operations for annual reporting to NAEIS in line with license conditions for NEM:AQA Section 21 listed activities. Key emission sources include bulk fuel storage (specifically ULP, diesel and crude oil).

#### **AQIA for Refinery Process Changes, SAPREF, KwaZulu-Natal, South Africa (2013)**

Assessment of air quality impacts associated with process changes required to meet revised fuel specifications. Emissions from onsite stacks and tanks were calculated using a mass balance approach and use of the United States Environmental Protection Agency's TANKS model respectively. Ambient concentrations of various pollutants were calculated using a Level 2 dispersion model (ADMS). Study results were presented at contentious community meetings in the South Durban Basin.

### **Air Quality Management Planning and Framework Development**

#### **AQMP for iLembe District Municipality, KwaZulu-Natal, South Africa (2022)**

Appointment by iLembe District Municipality to develop an Air Quality Management Plan (AQMP) for their jurisdiction, including a baseline assessment and the quantification and simulation of atmospheric emissions using a Level 3 (CALPUFF) dispersion model. A gap and problems analysis determined institutional capacity and identified information gaps. Based on these findings, air quality goals were developed, and practical intervention strategies designed. The study included recommendations for a customised air quality management by-law as well as a licensing guideline for the Air Quality Office (AQO).

#### **Air Quality Management Framework for the Cape Floral Region Protected Areas, Department of Forestry, Fisheries and Environment, Western Cape, South Africa (2020)**

Specialist air quality input to the Cape Floral Region Protected Areas (CFRPA) Environmental Management Framework (EMF). Due to high species richness and exceptional endemism, CFRPA is recognised as a globally significant centre for terrestrial biodiversity and was thus declared a World Heritage Site in 2004 by UNESCO. The study comprised a review of ambient air quality and prevailing meteorological conditions influencing regional dispersion. Recommendations were made for air quality management for CFRPA clusters. Key emission sectors included industrial development, domestic fuel burning, road traffic, waste treatment and disposal, agricultural activity (including crop spraying) and biomass burning.

#### **AQMP for Mbombela Local Municipality, Mpumalanga, South Africa (2020)**

Compilation of an AQMP for the City of Mbombela Local Municipality. The study comprised a baseline assessment including comprehensive emissions inventory and Level 3 dispersion modelling (CALPUFF), a feasibility assessment to determine institutional capacity, identify information gaps and analyse air pollution problems, the development of air quality goals and intervention strategies to achieve them, and an AQMP for adoption and implementation.

#### **AQMP for Msunduzi Local Municipality, KwaZulu-Natal, South Africa (2018 & 2019)**

Appointment to develop an AQMP in a two phased approach for the Msunduzi Local Municipality. Phase one comprised a geographical characterisation of the region, assessment of the status quo of air quality based on available ambient air quality monitoring data, an emissions inventory of identified emission sources, and an institutional capacity assessment. The emissions inventory was used in Phase Two of the AQMP as input to a Level 3 (CALPUFF) dispersion model and to develop effective air quality management strategies for the Municipality.

#### **AQMP for Capricorn District Municipality, Limpopo, South Africa (2017)**

Appointment to review the Capricorn District Municipality's 1<sup>st</sup> generation AQMP developed in 2009. The study comprised an appraisal of the previous AQMP and updates required. The baseline assessment included the quantification and simulation of atmospheric emissions within the District using a Level 3 dispersion model (CALPUFF). The gap and problem analysis determined institutional capacity and identified information gaps. Based on these findings, the 2009 air quality goals were realigned, and new intervention strategies designed.

### **Odour Impact Assessment**

#### **Nuisance Impact Assessment and Management Plan for Poultry Farming, Glen Arum Farms, KwaZulu-Natal, South Africa (2019 & 2020)**

Compilation of a nuisance risk assessment for Glen Arum's Kemell and Impangele egg layer operations in response to a non-compliance directive from the relevant authority. The directive required the development of a corrective management plan to address odour and control vectors.

The study included a baseline assessment of the locale, prevailing meteorology, and community concerns, with an assessment of odour and vector impacts linked to waste management. The odour assessment modelled the dispersion of odours into the surrounding landscape for comparison with relevant international guidance (in the absence of local standards).

**Odour Risk Assessment for Phase Two of the Pelican Park Housing Development, City of Cape Town, Western Cape, South Africa (2018 & 2021)**

Appointment by the City of Cape Town to conduct an odour risk assessment for Phase two of the proposed Pelican Park housing development. The proposed development site is located near the Cape Flats WWTW and Coastal Park landfill site. The aim of the specialist assessment was to determine the extent of odour nuisance and the long-term suitability of the proposed site for residential activity. The study applied monitoring (dynamic olfactometry) and dispersion modelling techniques (AERMOD) to assess the impact of neighbouring land use activities on local air quality. The study recommended additional odour monitoring, and this was conducted in 2020/2021.

**Air Quality and Odour Assessment for Shongweni Landholdings, Tongaat Hulett Developments, KwaZulu-Natal, South Africa (2019)**

Investigation into nuisance odour at Tongaat Hulett's landholdings earmarked for development purposes in Shongweni, KwaZulu-Natal. The study comprised ambient air quality measurements using both instantaneous and continuous monitoring methods. Odour levels were assessed using dynamic olfactometry and electronic nose (e-nose) technology. The study included a Level 3 (CALPUFF) dispersion modelling assessment of odour.

**Odour Impact Assessment for the Shongweni Landfill, Upper Highway Air NPO, KwaZulu-Natal, South Africa (2018)**

Appointment by the Upper Highway Air non-profit organisation to undertake an assessment of potential impacts of the EnviroServ Shongweni Landfill on the Upper Highway community. Field investigations included upwind, downwind and community comparative sampling of the odour plume for source appropriation and odorous compound identification. The study included an extensive literature review as well as statistical analysis of community complaints and wind direction data. A Level 3 (CALPUFF) dispersion modelling assessment of individual gases and cumulative odour was undertaken.

**Odour Assessment for Denny Mushroom Farm, Denny Mushrooms (Pty) Ltd, KwaZulu-Natal, South Africa (2017)**

Measurement of onsite and fenceline odour levels using an e-nose and a Level 1 dispersion modelling assessment of point source emissions to delineate an odour footprint.

**Odour Assessment for Pet Food Manufacturing, AVI (Pty) Ltd, KwaZulu-Natal, South Africa (2015 & 2017)**

Odour investigation for a pet food production facility. Odour monitoring was conducted using an e-nose at the site boundary and at selected community points at various times of the day, focusing on areas from which odour complaints originated. The findings of the investigation were incorporated to a comprehensive odour management plan (OMP) in line with international best practice and requirements stipulated by the local licensing authority. Reappointment in 2017 to audit the OMP.

**Odour Assessment for Maggot Protein Production, AgriProtein (Pty) Ltd, Western Cape, South Africa (2014)**

Odour assessment and development of an odour management plan for a nutrient recycling plant in the City of Cape Town. The site proposed to process organic waste, producing maggots for drying and milling as protein feedstock. A legal compliance assessment was conducted and AEL application compiled.

**Odour Assessment for Waste Compaction, Transnet Port Terminals (Pty) Ltd, KwaZulu-Natal, South Africa (2013)**

Assessment of the potential odour impact of a proposed galley waste compacting facility at the Port of Richards Bay. An odour emissions inventory was developed for input to a Level 2 atmospheric dispersion modelling (ADMS) to calculate odour concentrations at distances away from the proposed waste compactor. Odour plume maps were generated for impact interpretation.

## Noise Impact Assessments (NIA)

### **Der Brochen / Mototolo Mining Complex, Anglo American Platinum (2023 - 2024)**

Development of Noise Management and Monitoring Plans. Inventory development, RFI compilation, review of all previous applicable studies, risk assessment according to Anglo risk matrix and WRAC, provision of compliance requirements, reporting of Noise Management Plan and Noise Monitoring Programme.

### **Mogalakwena Mining Complex, Anglo American Platinum (2023 - 2024)**

Undertaking 2nd annual monitoring campaign as per Anglo NMP (by SLR), and review and updates of noise model and Noise Management Plan for 2nd and 3rd year.

### **EMPr Updates for Nyakabingo and Rutongo Mines, Trinity Metals, Rwanda, (2023-2024)**

Tin and Tungsten mining operations involving several sites at Rutongo and Nyakabingo mines. Review of all prior studies, RFI compilation and information collation, survey planning, site sub-consultant management, assessment, reporting, and provision of mitigation recommendations including BAT.

### **BUA Cement Sokoto Quarry & Cement Manufacturing Plant, BUAC Plc, Nigeria (2023 – 2024)**

7.5 Mtpa cement production plant located in Sokoto in north-west Nigeria. Thorough review of all prior studies, collating information, further survey planning, source characterization measurements, H&S compliance, engaging suppliers, sub-consultant management, highly detailed propagation modelling, assessment, provision of mitigation strategy based on hierarchy of impacts, training of personnel, and a Noise Management and Monitoring Plan report compilation.

### **Pemba Airport Upgrade NIA, Propav Infraestructuras, Zanzibar (2023)**

Proposed airport upgrade project on Pemba Island, Zanzibar. Survey planning, on-site surveys, H&S compliance, sub-consultant management, assessment, comprehensive noise management recommendations, and report compilation covering pre-construction, construction and operational phases.

### **Zanzibar 3 Roads Upgrade NIA, Propav Infraestructuras, Zanzibar (2023)**

Proposed 3 new/upgrade road routes on Unguja and Pemba Islands, Zanzibar. Survey planning, on-site surveys, H&S compliance, desktop calculation and assessment, and report compilation covering pre-construction, construction and operational phases.

## Health Risk Assessment (HRA)

### **HIA for Iron Ore Mining Operations, Jindal Iron Ore Project, KwaZulu-Natal, South Africa (2023)**

Health Impact Assessment of the proposed iron ore mining operations in Melmoth, and associated Community Health Monitoring and Management Plan to detect impacts timeously, and to avoid or mitigate potential negative impacts, while enhancing positive opportunities. This assessment was framed by a broad definition of health, moving beyond a traditional biomedical focus on the assessment of incidence and spread of disease to incorporate various aspects of physical, psychological, social and cultural well-being.

### **HRA for Vectors from Poultry Farming, Glen Arum Farms, KwaZulu-Natal, South Africa (2020)**

As part of the Nuisance Management Plan conducted for Glen Arums, Balgowan (see above) an assessment of vector related health risks for neighbouring sensitive receptors arising from facility design, operational procedures, waste management and vermin control practices were also assessed. The corrective action plan made recommendations for impact mitigation, effective waste management, community engagement and complaints investigations, based on international best practice.

### **HRA for Healthcare Risk Waste Incineration, Compass Medical Waste Services (Pty) Ltd, Gauteng, South Africa (2019)**

Compilation of HRA for a proposed medical waste thermal desorption unit in Olifantsfontein, Midrand. The key potential health hazards associated with the proposed development were identified as atmospheric emissions, biohazards, pests, odour, and noise. This study assessed likely health impacts from the proposed facility via multiple exposure pathways using internationally recognised methodologies for establishing distribution, likelihood, and significance of impact.

**HRA for Drakenstein Waste-to-Energy Project**, Interwaste (Pty) Ltd, Western Cape, South Africa (2016)

Compilation of a HRA (human, plant and animal health) for a proposed waste recovery, beneficiation and energy project comprising anaerobic digestion and direct combustion facilities. Potential health hazards associated with the proposed development included atmospheric emissions, water and soil contamination, biohazards and pests, and odour and noise. This study assessed likely health impacts from the proposed facility via multiple exposure pathways (including inhalation, dermal contact, and ingestion of locally produced crops and meat) using internationally recognised methodologies for establishing distribution, likelihood and significance of impact.

**HRA for Healthcare Risk Waste Incineration**, Sirela Trading (Pty) Ltd, KwaZulu-Natal, South Africa (2013)

Compilation of a HRA (human, plant and animal health) for a proposed waste recovery, beneficiation and energy project comprising anaerobic digestion and direct combustion facilities. Potential health hazards associated with the proposed development included atmospheric emissions, water and soil contamination, biohazards and pests, and odour and noise. This study assessed likely health impacts from the proposed facility via multiple exposure pathways (including inhalation, dermal contact, and ingestion of locally produced crops and meat) using internationally recognised methodologies for establishing distribution, likelihood and significance of impact.

**Greenhouse Gas (GHG) Inventories and Climate Change Risk Assessment (CCRA)**

**Future Pollutant Dispersion Scenarios for Holfontein Landfill**, Enviroserv Waste Management (Pty) Ltd, Gauteng, South Africa (2023)

This study reviewed the possible impacts of changing climate on local meteorology and how this changing meteorology may influence landfill gas production and dispersion of pollutants from the Holfontein landfill. The assessment included a Level 1 (SCREEN3) model to determine maximum impacts under two development pathway scenarios (i.e. best and worst case policy based outcomes) to cover a range of uncertainties in future climate projections. Outputs were presented as the relative (unitless) increase or decrease in ambient pollutant concentrations downwind of the landfill. These results can be calibrated for comparison with ambient standards using emission rates for individual gases.

**GHG Emissions Inventory for iLembe District Municipality**, KwaZulu-Natal, South Africa (2022)

A GHG emissions inventory for the iLembe District Municipality was developed as part of the District's AQMP (see above). Emissions for industrial activities, road traffic, domestic fuel burning, pre-harvest sugarcane burning, and electricity usage were calculated using IPCC emission factors and presented by emission scope in line with the *Greenhouse Gas Protocol: Global Protocol for Community-scale Greenhouse Gas Emission Inventories*.

**Emissions Inventory for Port of Durban**, C40 Cities, KwaZulu-Natal, South Africa (2021)

Compilation of an inventory of industrial, cargo handling, vehicular, rail and shipping emissions for the Port of Durban in a study funded by the C40 Cities' Empowering Cities with Data mechanism. GHG emissions were calculated using documented emission factors and presented by emission scope in line with the *Greenhouse Gas Protocol: Global Protocol for Community-scale Greenhouse Gas Emission Inventories*.

**CCIA for Hydrogen Manufacturing**, SAPREF, KwaZulu-Natal, South Africa (2019)

Review and validation of an existing GHG inventory for the SAPREF facility, calculation of GHG emissions associated with the proposed hydrogen manufacturing (HMU) using IPCC emission factors and GHG Protocol toolkits, and contextualisation of climate change implications through comparison of GHG emissions with local, national and international GHG inventories.

**Climate Change Adaptation and Resilience in Africa: Recommendations for Policy Makers**, funded by the Network of African Science Academies and the German National Academy of Sciences Leopoldina Interacademy Partnership, Africa (2015)

Editor of an advisory book, funded by Network of African Science Academies (NASAC) and German National Academy Leopoldina, to assess projected climate changes across Africa and to make

recommendations to African leaders on adaptation and resilience. The following sectors were assessed regionally: Access to Water, Food Security: Agriculture and Fisheries.

**Validity of Downscale Climate Models and the Implications of Possible Future Climate Change for Lake Kariba's Kapenta Fishery**, funded by IDRC/CDRI and DFID under the African Climate Change Fellowship Program 2009–2010. Zimbabwe (2013)

Application of downscaled global climate models to investigate the regional impacts of future emission scenarios with validation through prediction of past, observed climate. The IPCC A2 and B1 emission scenarios for the near (2046– 2065) and far (2081–2100) future. Nine models were employed and all reflected past climate (1961–2009) well. Results indicated that Kapenta fish production in Lake Kariba will continue to decline. Options and strategies for fishery management were recommended in the context of future climate changes. The study was funded by the International Development Research Centre (IDRC/CDRI) and the United Kingdom's Department for International Development (DFID), and published in a peer-reviewed journal.

## Memberships and Associations

- National Association for Clean Air (NACA)
- South African Council for Natural Scientific Professions (SACNASP)

## Publications and Conference Papers

- Manqele, N.M., Moolla, R. and Ramsay, L.F. (2024). "A mid-tier approach to estimating Durban's Port Marine Mobile Emissions: Gauging air quality impacts in South Durban". *Atmosphere*, 15, 1207.
- Ashram, K., Mitku, A., Ramsay, L.F., Jeena, P.M. and Naidoo, R.N. (2024). "Environmental exposures associated with early childhood recurrent wheezing in the Mother and Child in the Environment Birth Cohort: a time-to-event study". *Thorax*, doi:10.1136/thorax-2023-221150
- Manqele, N.M., Moolla, R. and Ramsay, L.F. (2024). "The health and economic impacts of exposure to marine mobile emissions from ships in Durban port, South Africa". *Atmospheric Environment: X*, 23, 1000277.
- Benschop, N.D., Chironda-Chikanya, G., Naidoo, S., Jafta, N., Ramsay, L.F., Naidoo, R.N. (2023). "El Niño, Rainfall and Temperature Patterns Influence Perinatal Mortality in South Africa: Health Services Preparedness and Resilience in a Changing Climate". In: Akhtar, R. (eds) *Climate Change and Human Health Scenarios. Global Perspectives on Health Geography*. Springer, Cham.
- Procheş Ş., Watkeys M.K., Ramsay L.F. and Cowling R.M. (2023). "Why we should be looking for longitudinal patterns in biodiversity". *Frontiers in Ecology and Evolution*. 11: 1032827.
- Tularam, H.; Ramsay, L.; Mutttoo, S; Brunekreef, B.; Meliefste, K; De Hoogh, K. and Naidoo, R.N. (2019). "A hybrid air pollution / land use regression model for predicting air pollution concentrations in Durban, South Africa". *Environmental Pollution*. 274: 116513.
- Tularam, H.; Ramsay, L.; Mutttoo, S; Naidoo, R.N.; Brunekreef, B.; Meliefste, K and De Hoogh, K. (2019). "Harbor and intra-city drivers of air pollution: Findings from a land use regression model, Durban, South Africa". *International Journal of Environmental Research and Public Health*, 17(15): 5406.
- Mutttoo, S.; Ramsay, L.; Brunekreef, B.; Beelen, R.; Meliefste, K. and Naidoo, R.N. (2018). "Land use regression modelling estimating nitrogen oxides exposure in industrial south Durban, South Africa". *Science of the Total Environment*, 610–611: 1439–1477.

- Ramsay, L. and Olago, D. (eds). (2016) "Climate Change Adaptation and Resilience in Africa: Recommendations to Policymakers", Network of African Science Academies (NASAC) and German National Academy Leopoldina.
- Pillay, K. and Ramsay, L.F. (2015). "Restructuring the Reduced Emissions from Deforestation and Forest Degradation (REDD+) mechanism for a Post Kyoto Agreement." *American Journal of Climate Change* 4(1): 69-76.
- Padayachee, Y.; Proches, S. and Ramsay, L.F. (2014). "Beetle assemblages of indigenous and alien decomposing fruit in subtropical Durban, South Africa." *Arthropod Plant Interactions* 8(2), pp. 135-142.
- Manqele, N.M. and Ramsay, L.F. "Evaluating the contribution of exhaust gas emissions to air pollution and the urban carbon footprint: A case study of the Port of Durban.", National Association for Clean Air (NACA) Annual Conference, Durban, 9-10 October 2014.
- Ndebele-Murisa, M.R.; Hill T. and Ramsay, L.F. (2013). "Validity of downscaled climate models and the implications of possible future climate change for Lake Kariba's Kapenta fishery." *Environmental Development*, 5: 109-130.
- Gumede, P. and Ramsay, L.F. "Community discernments of particulate matter emanating from a landfill site in Durban, KwaZulu-Natal," 16th International Union of Air Pollution Prevention and Environmental Protection Associations (IUAPPA) Clean Air Congress, Cape Town, South Africa, 29 September-4 October 2013.
- Simpson, A. and Ramsay, L.F. "Topographic control of wind field in the nearsurface boundary layer." 16th International Union of Air Pollution Prevention and Environmental Protection Associations (IUAPPA) Clean Air Congress, Cape Town, 29 September-4 October 2013.
- Ramsay, L.F. and Naidoo, R. (2012). "Carbon footprints, industrial, transparency and community engagement in a South Durban neighbourhood." *South African Geographical Journal*, 94 (2): 174-190.
- Ramsay, L.F. (2012). "Severe Weather Bill Warning." *The Mercury*, editorial, 1 February 2012, pp. 6.
- Tularam, H. and Ramsay, L.F. "Air quality in the Durban South Basin linked to synoptic events for the year 2009." National Association for Clean Air (NACA) Annual Conference, East London, 12-14 October 2011.
- Grenfell, S.E.; Ellery, W.N.; Grenfell, M.C.; Ramsay, L.F.; and Flugel, T.J. (2010). "Sedimentary facies and geomorphic evolution of a blocked-valley lake: Lake Futululu, Northern KwaZulu-Natal, South Africa." *Sedimentology* 57: 1159-1174.
- Ramsay, L.F. (2009). "Climate Change for the People of South Durban." *Changing Tomorrow* series, SDCEA and Oxfam Great Britain, pp. 34. Ellery, W.; Grenfell, M.; Grenfell, S.; Kotze, D.; McCarthy, T.; Tooth, S.; Grundling, P.-L.; Beckedahl, H.; Le Maitre, D. and Ramsay, L.F. (2008). "Controls on the distribution and dynamics of wetlands in South Africa." *Wetland Management Series: WET-Origins*.
- Ellery, W.; Grenfell, M.; Grenfell, S.; Kotze, D.; McCarthy, T.; Tooth, S.; Grundling, P.-L.; Beckedahl, H.; Le Maitre, D. and Ramsay, L.F. (2008). "Controls on the distribution and dynamics of wetlands in South Africa." *Wetland Management Series: WET-Origins*.
- Ramsay, L.F. "Asthma in the township communities of South Durban." *Workshop on Chronic Disease and African Communities: Research, Practice and Policy*, London School of Economics and Political Science, London, 23-24 June 2008.
- Ramsay, L.F. "Tropospheric ozone profiling for Irene, South Africa." *Global Change and Regional Sustainability in South Africa*, Kirstenbosch Gardens, 27-29 October 2003.

## Awards

- WSP Innovation Award (2021)
- Overseas Research Studentship, University of Cambridge (2007-2009)
- Landscape Research Group Award, University of Oxford (2006)
- Commonwealth Scholarship, University of Cambridge (2005)
- Vice-Chancellor's Award, University of Natal (2000)



**herewith certifies that**

**Lisa Frost Ramsay**

Registration Number: 168306

**is a registered scientist**

in terms of section 20(3) of the Natural Scientific Professions Act, 2003  
(Act 27 of 2003)

in the following field(s) of practice (Schedule 1 of the Act)

Environmental Science (Professional Natural Scientist)

Effective **6 May 2026**

Expires **31 March 2027**



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President of Council

A stylized, handwritten signature in black ink, likely belonging to the Chief Executive Officer.

Chief Executive Officer



Loren has 17 years' experience in air quality management, impact assessment, and compliance. She provides a range of specialist services, including atmospheric emission inventories, dispersion modelling, nuisance and health impact assessments, regulatory compliance support, and air quality management planning. Her portfolio includes both local and international projects across sectors such as mining, industry, energy, agriculture, waste management, logistics, infrastructure and the public sector.

#### Key Expertise:

- Air quality impact assessments (AQIA) and atmospheric impact reporting (AIR)
- Emission inventories and dispersion modeling (AERMOD, CALPUFF, SCREEN3)
- Regulatory compliance (AEL applications, NAEIS & SAGERS reporting)
- Air quality management planning (AQMP)
- Odour impact assessment
- Health impact assessment
- Greenhouse gas emission inventories

## Education

- Bachelor of Social Science (Hons) – Geography & Environmental Management, University of KwaZulu-Natal (2007)
- Bachelor of Social Science – Geographical Science, University of KwaZulu-Natal (2006)

## Project Experience

### Air Quality Impact Assessment and Atmospheric Impact Reporting

- **BESS Fire Plume Assessment, Energy Group, Limpopo (2026)** – Level 1 (SCREEN3) AQIA of emissions from a hypothetical thermal runaway event and inhalation risk from pollutant entrainment to underground mine workings.
- **Aluminium Production, South32 Hillside Aluminium, KwaZulu-Natal (2025)** – Level 3 (CALPUFF) AQIA and Section 12(A) minimum emission standards amendment application for primary aluminium production and associated hydrogen fluoride emissions.
- **Offshore Crude Oil Production, TotalEnergies, Namibia (2025)** – CALPUFF assessment of offshore production, nearshore transshipment and unplanned spill/blow-out emission scenarios.
- **Gold Mining, B2Gold Otjikoto, Namibia (2025)** – IFC compliant AQIA (AERMOD) for proposed mine expansion.
- **Nickel Mining, Tembo Nickel Corporation Limited, Tanzania (2025)** – IFC compliant AQIA (AERMOD) for the proposed open-cast Kabanga nickel mine.
- **General Waste Landfill, South32 Hotazel Manganese Mines, Northern Cape (2025)** – Baseline assessment and scoping for waste landfill EIA.
- **Onshore Gas Exploration** – Level 1 AQIAs for onshore gas exploration projects in South Africa:
  - Block ER379, Mpumalanga, Rhino Oil and Gas Exploration SA (2024)
  - Block ER378, Free State, Rhino Oil and Gas Exploration SA (2024)
  - Block ER377, Free State, Rhino Oil and Gas Exploration SA (2024)
- **Offshore Gas Exploration** – Level 1 or Level 2 AQIAs for offshore gas exploration projects along the coastline of South Africa & Namibia:
  - Block DWOB South, Orange Basin, TotalEnergies (2025)
  - Block 2814A, Orange Basin, BW Kudu (2025)
  - Block Northern Cape Ultra Deep, Shell Offshore Upstream SA BV (2024)
  - Block 2914A, Orange Basin, Rhino Resources (2024)
  - Block 2813B, Orange Basin, Harmattan Energy (2024)

- **Steel Production, Scaw South Africa, Gauteng (2024)** – Level 2 AQIA and AEL variation application for electric arc furnaces, combustion installations (including waste-co feeding).
- **Liquid Mud Plant, Halliburton, Namibia (2024)** – Specialist opinion and impact statement for drilling mud mixing and treatment at the Port of Walvis Bay.
- **Hazardous Waste Management, Namwaste, Namibia (2024)** – IFC compliant AQIA including baseline monitoring, AERMOD modelling and impact assessment for health risk (including cancer) and nuisance from hazardous waste landfilling.
- **Zinc Smelting, Black Mountain Mining, Northern Cape (2023)** – Level 2 AQIA and AEL variation application for production and processing of zinc, smelting and converting of sulphide ores, production of acids and bulk fuel/chemical storage.
- **Solar Photovoltaic (PV) Power Generation, Marula Platinum, Limpopo (2023)** – Specialist opinion and impact statement for solar PV in the context of existing air pollution sources within a mining rights area.
- **Infrastructure Upgrades, Zanzibar (2023)** – Baseline air quality survey and impact assessment for road and airport upgrades.
- **Charcoal Manufacturing, E&C Charcoal, KwaZulu-Natal (2023)** – Level 3 AQIA and NEM:AQA S22A AEL application for charcoal production and associated combustion installations.
- **Aluminium Production, South32 Hillside Aluminium, KwaZulu-Natal (2023)** – Level 3 AQIA and legal opinion for primary aluminium production and associated Casthouse operations.
- **Waste Oil Recycling, Eco Energy, Gauteng (2022)\*\*** – Level 2 AQIA (including odour nuisance study) and AEL application for industrial fuel oil recycling and associated combustion installations.
- **Green Ammonia Production, ENERTRAG South Africa, Mpumalanga (2022)\*\*** – Specialist impact statement and provisional AEL application for two renewable energy complexes producing green ammonia.
- **Hazardous Waste Landfilling, Dolphin Coast Landfill Management, KwaZulu-Natal (2022)\*\*** – Level 3 AIR of air quality impacts and nuisance odour.
- **Liquid NPK Fertilizer Production, Omnia Group, Free State (2022)\*\*** – Level 2 AQIA for provisional AEL renewal for the production of chemical fertilizer.
- **Underground Gold Mining, Sibanye-Stillwater, Gauteng (2022)\*\*** – Level 2 AQIA and AEL variation application for precious metal production and refining.
- **Polyurethane Foam Production, Strandfoam Group, Western Cape (2022)\*\*** – Level 2 AQIA and NEM:AQA S22A AEL application for organic chemicals and associated combustion installations.
- **Refinery Flare Stack Upgrade, SAPREF, KwaZulu-Natal (2021)\*\*** – Level 3 AQIA and AEL variation application for catalytic cracking units, sulphur recovery, combustion installations and bulk fuel/chemical storage.
- **Municipal Waste Landfill Fire, KZN EDTEA, KwaZulu-Natal (2021)\*\*** – Level 3 AIR of a fire event at the New England Road Landfill, Pietermaritzburg.
- **Wastewater Treatment, Metito Utilities, Serbia (2021)\*\*** – IFC compliant AQIA including baseline monitoring, AERMOD modelling and assessment of health and odour impacts from wastewater treatment.
- **Open-pit Iron Ore Mining, Assmang, Northern Cape (2021)\*\*** – Baseline assessment and scoping for mining rights amendment application.
- **Coal Handling & Stockpiling, South32, Mpumalanga (2020)\*\*** – Level 2 AQIA for new run-of-mine infrastructure.
- **Chemical Manufacturing and Packaging, Richbay Chemicals, Gauteng (2020)\*\*** – Level 2 AQIA and AEL application for organic chemicals and production of acids.
- **Refinery Shutdown and Startup, SAPREF, KwaZulu-Natal (2020)\*\*** – Level 3 AIR of emergency flaring events at South Africa's largest crude oil refinery.
- **Municipal Waste Landfilling, Drakenstein Municipality, Western Cape (2020)\*\*** – Level 2 AQIA for proposed landfill height increase and associated waste management license amendment application.

\*\*Denotes experience completed at another firm

- **Healthcare Risk Waste Incineration, Compass Medical Waste, Gauteng (2019)\*\*** – Level 2 AQIA and AEL application for thermal treatment of hazardous waste.
- **Pet Cremation, Legacy Pet, Gauteng (2018)\*\*** – Level 2 AQIA and AEL application for crematoria and veterinary waste incineration.
- **Nut Processing, Golden Macadamias, Mpumalanga (2018)\*\*** – Level 1 AQIA for combustion installations.
- **Lubricant Packaging, Indy Oils, KwaZulu-Natal (2017)\*\*** – Level 2 AQIA and AEL application for bulk fuel/chemical storage.
- **Conveyor Belt Manufacturing, Fenner Conveyor Belting, Gauteng (2016)\*\*** – Level 2 AQIA and AEL application.
- **Kipoi Open-pit Copper Mining, Tiger Resources, Democratic Republic of Congo (2016)\*\*** – AERMOD AQIA
- **Open-pit and Underground Coal Mine, Khongoni Haaskraal, Limpopo (2016)\*\*** – AERMOD AQIA for mining rights amendment application.
- **Glass Manufacturing, Afriglass, Western Cape (2009)\*\*** – AERMOD AQIA for compliance with recognised standards.

## Air Quality Management Planning and Framework Development

- **Dust Management Plan for Construction Activities, Black Mountain Mining, Northern Cape (2023)** – Aggeneys Substation.
- **AQMP for the iLembe District Municipality, KwaZulu-Natal (2022)\*\*** – Emissions inventory, CALPUFF dispersion model, customised air quality management by-law and a licensing guideline.
- **Air Quality Management Framework for the Cape Floral Region Protected Areas, Department of Forestry, Fisheries and Environment, Western Cape (2020)\*\*** – Air quality management strategy for a UNESCO World Heritage Site.
- **AQMP for the Mbombela Local Municipality, Mpumalanga (2020)\*\*** – Emissions inventory, CALPUFF dispersion model, and an AQMP for adoption and implementation.
- **AQMP for Bulk Fuel and Chemical Storage, Vopak Terminal Durban, KwaZulu-Natal (2019)\*\*** – Odour nuisance, emergency incidents and emissions reduction strategy.
- **AQMP for the Msunduzi Local Municipality, KwaZulu-Natal (2018 & 2019)\*\*** – Air quality emissions inventory, CALPUFF dispersion model, and an AQMP for adoption and implementation.
- **AQMP for the Capricorn District Municipality, Limpopo (2017)\*\*** – Review of first-generation AQMP with updated CALPUFF modeling.
- **AQMP for Treated Timber Manufacturing, FAR Timbers, KwaZulu-Natal (2016-2017)\*\*** – Emissions inventory, impact mitigation and monitoring, and compliance reporting programme.
- **AQMP for the uMgungundlovu District Municipality, KwaZulu-Natal (2016)\*\***
- **AQMP for the Bojanala Platinum District Municipality, Limpopo (2010)\*\***
- **AQMP for the West Coast District Municipality, Western Cape (2010)\*\***
- **AQMP for the Fezile Dabi District Municipality, Free State (2009)\*\***

## Regulatory Compliance and Emissions Reporting

- **AEL Renewal & Transfer for Eastern Cape Incineration Services, Gauteng (2023)** – Thermal treatment of hazardous waste.
- **Emissions Inventories for FFS Refiners (2023-2024)** – Eight petroleum product facilities including bulk fuel/chemical storage, industrial fuel oil recycling, and tar processes.
- **Emissions Inventories and NAEIS reporting for Bidvest Tank Terminals (2022)\*\*** – Bulk fuel/chemical storage for Richards Bay, Durban and Isando operations.
- **AEL Compliance Reporting for Vopak Terminal Durban, KwaZulu-Natal (2019-2022)\*\*** – Emissions inventories, NAEIS reporting, emission testing, LDAR surveys, fenceline monitoring and auditing for bulk fuel/chemical storage.

- **Emissions Inventories and NAEIS reporting for Strandfoam Group, Western Cape (2021 & 2022)\*\*** – Polyurethane foam production including organic chemical storage and associated combustion installations.
- **AEL Transfer Application and Compliance Reporting for Safripol, KwaZulu-Natal (2019-2022)\*\*** – Emissions inventories, NAEIS reporting, LDAR surveys, fenceline monitoring and auditing for Polyethylene Terephthalate Production (Organic Chemicals).
- **AEL Renewal Application, Emissions Inventories and NAEIS reporting for FAR Timbers, KwaZulu-Natal (2017-2019)\*\*** – Wood drying and the manufacture of wood products.
- **Emissions Inventories and NAEIS reporting for NATREF, KwaZulu-Natal (2016-2018)\*\*** – Bulk fuel and crude oil storage.

## Odour Nuisance Assessment

- **Odour Assessment for Waste Oil Recycling, Eco Energy, Gauteng (2022)\*\*** – Dynamic olfactometry and Level 2 dispersion modelling
- **Odour Assessment for Wastewater Treatment, Robben Island Museum, Western Cape (2022)\*\*** – UNESCO World Heritage Site.
- **Odour Assessment for Hazardous Waste Landfilling, Dolphin Coast Landfill Management, KwaZulu-Natal (2022)\*\*** – Dynamic olfactometry and Level 3 dispersion modelling.
- **Odour Assessment and Management Plan for Poultry Farming, Glen Arum Farms, KwaZulu-Natal (2019 & 2020)\*\*** – Level 2 dispersion modelling
- **Odour Assessment for Phase Two of the Pelican Park Housing Development, City of Cape Town, Western Cape (2018 & 2021)\*\*** – Dynamic olfactometry and Level 2 dispersion modelling
- **Air Quality and Odour Assessment for Shongweni Landholdings, Tongaat Hulett Developments, KwaZulu-Natal (2019)\*\*** – Level 2 dispersion modelling
- **Odour Assessment for the Shongweni Landfill, Upper Highway Air NPO, KwaZulu-Natal (2018)\*\*** – Dynamic olfactometry and Level 3 dispersion modelling
- **Odour Assessment for Denny Mushroom Farm, Denny Mushrooms, KwaZulu-Natal (2017)\*\***

## Greenhouse Gas Inventories and Climate Change Risk Assessment

- Future Pollutant Dispersion Scenarios for Hazardous Waste Landfilling, EnviroServ Waste Management, Gauteng (2023) – Level 1 dispersion modelling
- GHG Emissions Inventory and SAGERS Reporting for Bidvest Tank Terminals, KwaZulu-Natal and Gauteng (2022)\*\* – Combustion installations
- GHG Emissions Inventory for iLembe District Municipality, KwaZulu-Natal (2022)\*\*
- Emissions Inventory for Port of Durban, C40 Cities, KwaZulu-Natal (2021)\*\*
- GHG Emissions Inventory for City of Joburg, Johannesburg Metropolitan Municipality, Gauteng (2009)\*\*

## Health Impact Assessment

- HIA for Hazardous Waste Landfilling, EnviroServ Waste Management, Gauteng (2023)
- HIA for Disease Vectors from Poultry Farming, Glen Arum Farms, KwaZulu-Natal (2020)\*\*
- HIA for Healthcare Risk Waste Incineration, Compass Medical Waste Services, Gauteng (2019)\*\*

## Memberships and Associations

- National Association for Clean Air (NACA)
- South African Council for Natural Scientific Professions (SACNASP) – registration pending

Sheena has a comprehensive background in occupational and environmental health, supported by both industry and academic experience. Her expertise spans air quality, noise, and community health impact assessment, including the development of management and monitoring plans aligned with regulatory and international best practice requirements. She has experience in developing air emissions inventories and applying dispersion and screening models such as SCREEN3, AERMOD, LandGEM, and TANKS. In addition, she utilises public health risk assessment and epidemiological tools, including WHO AirQ+ for health impact quantification and Stata for advanced statistical analysis. She also serves as an Honorary Lecturer at the College of Health Sciences, University of KwaZulu-Natal, contributing to the postgraduate training programme and actively engaged in research on air pollution, climate change, and health. She has authored multiple peer-reviewed publications and conference abstracts, reflecting her active contribution to advancing knowledge and practice in the field.

## Education

- Doctor of Philosophy, Occupational and Environmental Health, University of KwaZulu-Natal (2022)
- Master of Medical Science, Occupational and Environmental Health, University of KwaZulu-Natal (2013)
- Bachelor of Technology, Environmental Health, Durban University of Technology (2011)
- National Diploma, Environmental Health, Durban University of Technology (2008)

## Project Experience

### Health Impact Assessment (HIA)

#### **HIA for a Power Transmission Line, Kabanga Mine, Ngara District, Tanzania (2026)**

Current assessment comprising an IFC-compliant CHIA, including screening of project-relevant environmental health areas, identification of key exposure pathways including electromagnetic field exposure, and significance assessment of potential community health impacts. The study also involves compilation of a community health and safety monitoring programme encompassing relevant indicators for ongoing impact management and performance evaluation, in alignment with IFC Performance Standards and international good practice.

#### **HIA for a Thermal Power Plant, Ugesi TPP, KwaZulu-Natal, South Africa (2026)**

Compilation of a IFC compliant HIA for a thermal power plant. Hazards identified with potential for adverse health impacts included the emission of fine particulates, gases and noise. This study assessed likely health impacts via various exposure pathways using internationally recognised methodologies for establishing distribution, likelihood and significance of impact.

#### **HIA for a Thermal Power Plant, ACWA Power, Secunda, Mpumalanga, South Africa (2025)**

Compilation of a IFC compliant HIA for a thermal power plant. Hazards identified with potential for adverse health impacts included the emission of fine particulates, gases and noise. This study assessed likely health impacts via various exposure pathways using internationally recognised methodologies for establishing distribution, likelihood and significance of impact.

#### **HIA for a Uranium Processing Plant, Cooke Uranium, Johannesburg, South Africa (2025)**

Appointed to assess health impacts of the proposed uranium processing plant. Hazards identified with potential for adverse health impacts included emission of fine particulates, gases and noise. This study assessed likely health impacts in relation to multiple exposure pathways (including inhalation, dermal contact, and ingestion of locally produced crops and

meat) using internationally recognised methodologies for establishing distribution, likelihood and significance of impact.

**Community health baseline study for a Wind Energy Facility**, Green Fuel Alliance, Egypt (2025)

Applied environmental health baseline profiling methods to characterise community health context and potential exposure pathways relevant to renewable energy infrastructure. Utilised the International Finance Corporation (IFC) health impact assessment (HIA) framework to evaluate potential project-related health risks and support sustainable energy development decision-making.

**HIA memo for a Residential Housing Development**, Carter's Glen Residential Development Kimberly, Northern Cape, South Africa (2025)

Applied internationally recognised environmental and public health risk assessment methodologies in line with IFC and WHO guidance to evaluate community exposure to project-related environmental hazards. The assessment included evaluation of hazard quotients, mortality and morbidity risk estimates, and lifetime cancer risk associated with radon exposure, informed by relevant IFC EHS Guidelines.

**HIA for a Waste Management Facility**, Inter-waste Wesco Waste Management Facility, Western Cape, South Africa (2024)

Appointed to assess health impacts of the proposed waste management facility and associated infrastructure. Hazards identified with potential for adverse health impacts included emission of fine particulates, gases and noise. This study assessed likely health impacts in relation to multiple exposure pathways (including inhalation, dermal contact, and ingestion of locally produced crops and meat) using internationally recognised methodologies for establishing distribution, likelihood and significance of impact.

**HIA for Thermal Power Plant**, Zosma Energy, Mpumalanga, South Africa (2024)

Compilation of a health impact assessment for a thermal power plant. Hazards identified with potential for adverse health impacts included emission of fine particulates, gases and noise. This study assessed likely health impacts via various exposure pathways using internationally recognised methodologies for establishing distribution, likelihood and significance of impact.

**HIA for a Thermal Power Plant, Solar & BESS**, Schoongezicht Thermal Power Plant, Gauteng, South Africa (2024)

Compilation of a health impact assessment for a thermal power plant. Hazards identified with potential for adverse health impacts included the emission of fine particulates, gases and noise. This study assessed likely health impacts via various exposure pathways using internationally recognised methodologies for establishing distribution, likelihood and significance of impact.

**HIA for a Thermal Power Plant**, Pictor Thermal Power Plant, KwaZulu-Natal, South Africa (2024)

Compilation of a health impact assessment for a thermal power plant. Hazards identified with potential for adverse health impacts included emission of fine particulates, gases and noise. This study assessed likely health impacts via various exposure pathways using internationally recognised methodologies for establishing distribution, likelihood and significance of impact.

**HIA for Hazardous Waste Landfilling**, Holfontein Hazardous Waste Management Facility, Mpumalanga, South Africa (2023)

Compilation of a health impact assessment for a hazardous waste management facility to expand their licensed footprint onto adjacent property, increasing capacity to receive waste and extend the life of the facility. Hazards identified with potential for adverse health impacts

included emission of fine particulates, nuisance dust, odour and increased traffic. This study assessed likely health impacts in relation to multiple exposure pathways (including inhalation, dermal contact, and ingestion of locally produced crops and meat) using internationally recognised methodologies for establishing distribution, likelihood and significance of impact.

## **HIA for Mining, Jindal Melmoth Iron Ore Project, KwaZulu-Natal, South Africa (2023)**

Peer review of the health impact assessment of the proposed iron ore mining operations in Melmoth, and associated Community Health Monitoring and Management Plan to detect impacts timeously, and to avoid or mitigate potential negative impacts, while enhancing positive opportunities. This assessment was framed by a broad definition of health, moving beyond a traditional biomedical focus on the assessment of incidence and spread of disease to incorporate various aspects of physical, psychological, social and cultural well-being.

## **HIA for Shipping Emissions, KwaZulu-Natal, South Africa (2023)\*\***

An assessment of the impact of shipping emissions on population health in Durban was undertaken. The assessment was intended to establish if the International Maritime Organization recent global standards of reduced sulphur in fuel as effected in 2020 has resulted in a reduction in the burden of disease attributed to shipping emissions in the Durban region.

## **HIA for Vulnerable Groups in a Research Study, KwaZulu-Natal, South Africa (2018-2022)\*\***

In a collaborative research project with the Swiss Tropical and Public Health Institute, detailed exposure assessment was undertaken for infants residing in a highly industrialized setting. An integrated approach using land use regression modelling and dispersion modelling was used to establish residential level exposure to particulate matter and oxides of nitrogen. Exposure to these pollutants was shown to impact on sensitive markers of lung function in infancy, with a risk of developing long-term respiratory effects such as asthma in later life.

## **HIA for Occupational Exposures in the Traditional Medicine Trade, KwaZulu-Natal, South Africa (2019)\*\***

A research study was undertaken to identify occupational risks associated with informal trading with a focus on traditional medicine. A critical evaluation of the workplace setting, and daily operation was conducted by a walk-through survey. A comprehensive hazard identification and risk assessment was completed, which found that there were various ergonomic, physical, chemical, biological and environmental hazards associated with informal trading in this sector.

## **Air Quality Impact Assessment (AQIA) and Atmospheric Impact Reporting (AIR)**

### **Air Quality Assessment for a Vaccine Manufacturing Plant, Biovac, Cape Town, South Africa (2026)**

Baseline assessment, including ambient air quality monitoring, to characterise existing conditions prior to the project development. The assessment involved field-based monitoring, identification of sensitive receptors, and evaluation of prevailing environmental conditions. Findings were used to establish baseline air quality and inform air quality management and assessment requirements.

### **AQIA for a Uranium Processing Plant, Cooke Uranium, Johannesburg, South Africa (2025)**

Appointment to conduct an AQIA assessing atmospheric impacts of the proposed uranium processing plant. Application of level 2 dispersion modelling (AERMOD) to assess the cumulative ambient impacts of the proposed development. Ambient concentrations were compared with local standards and international guidelines. Recommendations for emissions reduction and ambient air quality improvement were provided.

## **AQIA for Hazardous Waste Incineration, Karo Platinum Mine, Zimbabwe (2025)**

Appointment to conduct an AQIA assessing atmospheric impacts of the proposed waste management facility (WMF) handling general and hazardous waste types. Application of level 2 dispersion modelling (AERMOD) to assess the cumulative ambient impacts of the WMF. Ambient concentrations were compared with local standards and international guidelines. Recommendations for emissions reduction and ambient air quality improvement were provided.

## **AQIA for a Multi-Metal Processing Facility (MMPF), Tembo Nickel, Kahama, Tanzania (2025)**

Appointment to conduct an AQIA assessing atmospheric impacts of the proposed MMPF. Application of level 2 dispersion modelling (AERMOD) to assess the cumulative ambient impacts of the MMPF. The ambient concentrations were compared with local standards and international guidelines. Recommendations for emissions reduction and ambient air quality improvement were provided.

## **AQIA for Hazardous Waste Landfilling, Interwaste Hazardous Waste Management Facility, Namibia (2024)**

Appointment to conduct an AQIA assessing atmospheric impacts of the proposed development in Erongo, Namibia. Application of level 2 dispersion modelling (AERMOD) to assess the cumulative ambient impacts of hazardous waste landfilling operations. The ambient concentrations were compared with local standards and international guidelines. Recommendations for emissions reduction and ambient air quality improvement were provided.

## **AQIA for Offshore Gas Exploration, Namibia (2024)**

Peer review of the AQIA for offshore gas exploration off the coast of southern Namibia. The AQIA quantified emission rates for the proposed project using internationally recognised emission factors. Significant emission sources were identified based on the IFC EHS Guidelines. The ambient impacts of a single flaring event were simulated using a screening level dispersion model (SCREEN3) to understand worst-case downwind impacts. Impacts were rated using a standardised significance assessment matrix.

## **AQIA for Mining, Anglo American Platinum Mototolo Mine, Limpopo, South Africa (2024)**

Appointment to conduct an AQIA assessing atmospheric impacts. Application of level 2 dispersion modelling (AERMOD) to assess the cumulative ambient impacts of mining operations. The ambient concentrations were compared with local standards and international guidelines. Recommendations for emissions reduction and ambient air quality improvement were provided.

## **Air Quality Baseline Report for Mining, Trinity Mines, Northern Province, Rwanda (2023)**

Compilation of the baseline air quality reports for three mines namely Rutongo, Nyakabingo and Musha. Monitoring measurements included particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>) and gases (NO<sub>2</sub> and SO<sub>2</sub>). Findings were assessed for adherence to the East African Air Quality Standards and the World Health Organization Air Quality Guidelines.

## **Air Quality Baseline Report for Road Infrastructure, Propav Pemba Airport and Three Roads in Unguja, Zanzibar, Tanzania (2023)**

Compilation of the baseline air quality report for particulate matter (PM<sub>2.5</sub> and PM<sub>10</sub>) and gases (NO<sub>2</sub>, SO<sub>2</sub> and BTEX). Findings were assessed for adherence to the East African Air Quality Standards and the World Health Organization Air Quality Guidelines.

## **Air Emissions Inventory for Mining, Anglo American Platinum Mototolo Mine, Limpopo, South Africa (2023)**

Appointed to review and update the air emissions inventory for the Anglo-American Platinum Limited Der Brochen / Mototolo Complex considering both stationary sources (point, line and area,) and mobile sources (vehicles and equipment). This was established using the United States Environmental Protection Agency's AP42 emission factors. Two emission scenarios were considered, a baseline and proposed site developments.

## **Air Quality Monitoring Report for Waste Oil Recycling and Bulk Petroleum Product Storage, Mpumalanga, South Africa (2023)**

Appointment to conduct ambient air quality monitoring and reporting for the processing and refining of fuel and oil-based products. Key emissions at the facility included volatile organic compounds from the distillation processes, thermal units, and tanks, as well as inorganic combustion gases such as oxides of nitrogen and sulphur dioxide from boilers. Findings were assessed for adherence to the South African National Ambient Air Quality Standards.

## **Dust Fallout Monitoring Report for Mining, Anglo Mogalakwena Mine, Limpopo, South Africa (2023)**

Compilation of the monthly dust fallout monitoring report and quarterly ambient air quality monitoring report to assess regulatory compliance. Findings were assessed for adherence to the National Ambient Air Quality Standards.

## **Air Quality Management Planning (AQMP) and Framework Development**

### **AQMP for Mining, Anglo American Platinum Mototolo Mine, Limpopo, South Africa (2024)**

Appointment to develop an AQMP for mining operations addressing exploration, commissioning / construction, operations, closure and post-closure phases (decommissioning and rehabilitation) of the mine. The AQMP outlined recommendations to minimize the air emission impacts from project activities on local communities.

### **Air Quality Monitoring Programme for Mining, Anglo American Platinum Mototolo Mine, Limpopo, South Africa (2024)**

Appointment to develop an AQMP to measure and assess various air emissions at sensitive receptors during baseline (existing) operations, proposed construction activities at Der Brochen, and under future operational scenarios. The emissions inventory and risk assessment undertaken for the project informed the selection of pollutants that required monitoring. The report outlined key emissions relevant to mining operations, monitoring and equipment specifications as well a protocol for data validation, quality control and reporting.

### **Dust Management Plan for Construction Activities, ESKOM Aggeneys Substation, Northern Cape, South Africa (2023)**

Compilation of dust management plan for the construction phase of the ESKOM Aggeneys Substation Expansion project. Potential sources of fugitive emissions from construction activities were identified and relevant mitigation measures presented in adherence with a best practice approach for dust control. The report was compiled within the framework of the South African National Environmental Management Act, the Air Quality Act and the National Dust Control regulations.

## **Atmospheric Emission Licensing (AEL) and Compliance Reporting**

### **AEL Renewal for a Mortar Mix Plant, Mortar (SA), Cape Town, South Africa (2025)**

Appointed to facilitate the AEL renewal process for a mortar mix manufacturing plant. The scope of work included a review of existing licence conditions, assessment of operational compliance, compilation of regulatory documentation, coordination with authorities, and support to the application submission process. The project ensured continued regulatory compliance and alignment with applicable air quality legislation and permitting requirements.

## **Emissions Inventories for Waste Oil Recycling and Bulk Petroleum Product Storage, FFS Refiners (Pty) Ltd, KwaZulu-Natal and Mpumalanga, South Africa (2024)**

Emissions inventory development for two of FFS' petroleum product storage and oil recovery facilities, namely, Evander and Pietermaritzburg. Evaporative and loading losses were calculated using US EPA TANKS 4.09d and international emission estimation technique guidelines for the bulk storage and handling of products which included an array of base oils and lubricants, fuel oils, chemicals, bitumen, solvents, waste oils, vegetable oils and animal fats. These inventories were submitted to the online National Atmospheric Emissions Inventory System (NAEIS) portal, as part of FFS' annual reporting obligations.

## **Noise Impact Assessment (NIA)**

### **Noise Assessment for a Vaccine Manufacturing Plant, Biovac, Cape Town, South Africa (2026)**

Baseline assessment to characterise existing ambient noise conditions prior to project development. The assessment involved short-term and representative monitoring to establish background and residual noise levels at sensitive receptors. Measured noise levels were evaluated against applicable national standards and guideline criteria to determine potential compliance risks and inform project design and mitigation measures.

### **Noise Screening for a Wind Energy Facility (WEF), AMEA Power, Aysha WEF 1, Ethiopia (2025)**

Detailed evaluation of existing NIA studies to assess if noise monitoring and modelling meet international standards (i.e. IFC requirements for WEFs). Assessment of the implication of revised turbine specifications on the representativity of existing monitoring and modelling data. Recommendations provided regarding the need for additional noise assessment.

### **NIA for a Multi-Metal Processing Facility (MMPF), Tembo Nickel, Kahama, Tanzania (2025)**

Project support in conducting a NIA for the proposed MMPF. Soundplan was used to model noise propagation and assess cumulative impacts at sensitive receptors. Predicted noise levels were compared with local standards and international guidelines. Recommendations for noise reduction and mitigation were provided.

### **NIA for a Nickel Mine, Tembo Nickel, Kabanga, Tanzania (2025)**

Project support in conducting a NIA for the nickel mine. Soundplan was used to model noise propagation and assess cumulative impacts at sensitive receptors. Predicted noise levels were compared with local standards and international guidelines. Recommendations for noise reduction and mitigation were provided.

## **Odour Nuisance Assessment**

### **OA for a residential setting, Johannesburg, South Africa (2025)**

Odour assessment in response to a residential complaint using a qualitative, risk-based approach aligned with Institute of Air Quality Management (IAQM) guidance. The assessment incorporated FIDOL (Frequency, Intensity, Duration, Offensiveness, and Location) principles and sensory evaluation through direct sniff testing. Odour intensity was evaluated using the VDI 3940 scale. Findings were assessed in relation to odour perception and potential health impacts in accordance with international best-practice guidance.

## **Academic Research Collaborations**

### **Child Heat Impact-Climate Health Intervention (CHI-2) project, University of KwaZulu-Natal, South Africa, current (2026)**

International work package lead on a climate-health research programme funded by the Wellcome Trust, focusing on scientific assessment of heat and air pollution exposure among

children in disadvantaged and underserved communities across three countries: South Africa, Ethiopia, and Zimbabwe. The work package supports applied climate–health risk evaluation through development of high-resolution spatial and temporal exposure models using satellite remote sensing, ground monitoring data, and earth observation systems. Outputs are designed to support actionable risk identification, inform preventive intervention strategies, and strengthen evidence-based decision-making for protecting child health in urban and peri-urban environments.

**Mother and Child in the Environment Cohort study**, University of KwaZulu-Natal, South Africa, 2022-current

Responsible for the design and implementation of epidemiological methodologies to characterise maternal and child exposure to air pollution and other environmental stressors. Leading the development of exposure assessment frameworks, including spatial and temporal modelling approaches. Conducting statistical analyses to evaluate associations between environmental exposures, health outcomes, and socio-economic determinants. Overseeing the collection, quality control, management, and interpretation of primary and secondary health datasets, ensuring methodological rigour and alignment with ethical and research governance requirements.

## Memberships and Associations

- Health Professions Council of South Africa – HI 0075086

## Publications

- Muttoo S, Jeena PM, Rössli M, de Hoogh K, Naidoo RN, Jeena PM, Rössli M, Olin AC, Carlsen HK, Asharam K, Naidoo G, Mtiku AA, Naidoo RN. Low Birth Weight and Maternal Smoking as predictors of Infant Lung Function from a South African Birth Cohort within Low-Socioeconomic Communities. *South African Journal of Child Health*. 2023.
- Mitku AA, Zewotir T, North D, Jeena P, Asharam K, Muttoo S, Tularam H, Naidoo RN. Impact of ambient air pollution exposure during pregnancy on adverse birth outcomes: generalized structural equation modeling approach. *BMC Public Health*. 2023;23(1): 45.
- Muttoo S, Jeena PM, Rössli M, de Hoogh K, Naidoo RN. A Review of Ambient Air Pollution Exposure Assessment Methods in Determining Childhood Respiratory Health Effects in Children under Five. *Environments*. 2022;9(8):107.
- Tularam H, Ramsay LF, Muttoo S, Naidoo RN, Brunekreef B, Meliefste K, de Hoogh K. Harbor and Intra-City Drivers of Air Pollution: Findings from a Land Use Regression Model, Durban, South Africa. *International Journal of Environmental Research and Public Health*. 2020; 17(15):5406
- Mitku AA, Zewotir T, North D, Jeena P, Asharam K, Muttoo S, Tularam H, Naidoo RN. Impact of ambient air pollution exposure during pregnancy on adverse birth outcomes: generalized structural equation modeling approach. *BMC Public Health*. 2023;23(1): 45.
- Shezi, B, Naidoo R, Muttoo S, Mathee A, Alfiers L, Dobson R, Ndlovu P, Street R. Informal sector occupational hazards: an observational workplace assessment of the traditional medicine trade (South Africa). *International Journal of Occupational Safety and Ergonomics*. 2019:1-15.
- Naidoo P, Naidoo R, Ramkaran P, Muttoo S, Asharam K, Chuturgoon A. Maternal miRNA-146a G/C rs2910164 variation, HIV/AIDS and nitrogen oxide pollution exposure collectively affects foetal growth. *Human & Experimental Toxicology*. 2019;38(1):82-94.

- Muttoo S, Ramsay L, Brunekreef B, Beelen R, Meliefste K, Naidoo RN. Land use regression modelling estimating nitrogen oxides exposure in industrial south Durban, South Africa. *Science of the Total Environment*. 2018;610-611:1439-47.
- Anderson SM, Naidoo RN, Ramkaran P, Asharam K, Muttoo S, Chuturgoon A. OGG1 Ser326Cys polymorphism, HIV, obesity and air pollution exposure influences adverse birth outcome susceptibility, within South African Women. *Reproductive Toxicology*. 2018; 79:8-15.
- Nansook P, Naidoo R, Ramkaran P, Phulukdaree A, Muttoo S, Asharam K, et al. IL-1 $\beta$  haplotype influences the effect of NO $_x$  exposure on gestational age in the South African MACE birth cohort. *Human & Experimental Toxicology*. 2017.
- Anderson SM, Naidoo RN, Ramkaran P, Phulukdaree A, Muttoo S, Asharam K, et al. The Effect of Nitric Oxide Pollution on Oxidative Stress in Pregnant Women Living in Durban, South Africa. *Archives of Environmental Contamination and Toxicology*. 2018;74(2):228-39.
- Nansook P, Naidoo RN, Muttoo S, Asharam K, Ramkaran P, Phulukdaree A, et al. IL-17A (G197G)—Association between NO $_x$  and gestational age in a South African birth cohort. *International Journal of Immunogenetics*. 2018;45(2):54-62.

## Published Conference Papers

- Muttoo S, Jeena PM, Asharam K, Naidoo RN. Effect of short-term exposure to ambient nitrogen dioxide and particulate matter on repeated lung function measures in infancy: A South African birth cohort. *SATS Congress Abstracts. African Journal of Thoracic and Critical Care Medicine*. 2022, 28(1), p.40.
- Naidoo NR, Muttoo S, Jeena P, Asharam K, De Hoogh K, Rösli M. Short-term air pollutant exposure and infant lung function in a South African birth cohort. *European Respiratory Journal*. 2022, 60 (66).
- Muttoo S, Naidoo R, Jeena P, and Asharam K. Air Pollution Exposure and Infant Lung Function in the MACE Cohort, South Africa. *Environmental Epidemiology*. 2019, 3; p.280.
- Muttoo S, Naidoo RN, Meliefste K, Beelen R, Ramsay L. Lessons Learned from Land Use Regression Modelling in an Industrialized region in a developing country. In *ISEE Conference Abstracts*. 2016, 28 (1) p.3-298.

## Awards

- Best Abstract Award (2022) – South African Thoracic Society Congress
- Researcher Development Grant (2019) – South African Medical Research Council
- Research Fellowship (2019) – Swiss-African Research Cooperation
- International Travel Scholarship Award (2011) – Institute of Risk Assessment Sciences, Utrecht University, the Netherlands.



## **CERTIFICATE OF REGISTRATION**

**THIS IS TO CERTIFY THAT**

**SURNAME: MUTTOO**

**FIRST NAME: SHEENA**

**REGISTRATION NUMBER: HI 0075086**

**QUALIFICATIONS: Nat Dip Environmental Health (SA) 2007**

**REGISTER: ENVIRONMENTAL HEALTH PRACTITIONER**

**IS REGISTERED AS A  
ENVIRONMENTAL HEALTH PRACTITIONER**

**In the Category**

**INDEPENDENT PRACTICE**

**with effect from 3 Nov 2009**

**6 November 2025**

HPCSA Building  
553 Madiba Street  
Arcadia  
0083



Matthew is an air quality and noise monitoring consultant with over 11 years' fieldwork experience. He has been at the forefront of the development of point source emissions sampling in South Africa. In 2019 he was involved in the lobbying of the South African Government for the amendment of the National Environmental Management Air Quality Act (NEM: AQA) section 21 category 9 of the listed activities. This resulted in a positive change for industry.

With a background in mechanical engineering, Matthew has experience in boiler designs and operations, plant maintenance, process plant emissions and chimney stack monitoring.

Matthew has monitoring and consulting experience across Africa, including in Ghana, Mozambique, Namibia, and South Africa.

Matthew completed his National Diploma in 2013 at the University of Durban. Immediately after graduation he found an exciting opportunity to join the steam energy industry as an operator and soon after as production manager with Associated Energy Services overseeing the supply of steam energy in KZN at more than 11 sites.

## Education

- ☐ Ndip Mechanical Engineering (Durban University 2014)
- ☐ Level 2 fall arrest and basic rope access (2015)
- ☐ MWEF Licensed operator (2024)
- ☐ Basic Rigger (2017)

## Project Experience

### Consultant

#### **Air and Noise Monitoring Total Lang, Pemba Mozambique (2025 – Current)**

Appointed to install and monitor Air Quality and Noise levels in the project area. To maintain a monitoring network of live dust monitors (Zwinsofts) and passive gas samplers. Monthly reporting of data and coordination of sample submissions to labs.

#### **Air and Noise Monitoring BIOVAC, Cape Town (2025-2026)**

Deployment of dust monitor, passives and day and night noise monitoring. BioVac a vaccine manufacturing institute looking to expand its operations was required to carry out environmental assessments, to this end SLR was appointed to carry out baseline assessments.

#### **AQIA for Iduapriem Mine, AngloGold Ashanti, Ghana (2024 – 2026)**

Appointment to develop, install and manage an air quality monitoring network (dust fallout, continuous particulate and passive gas monitoring using polludrones) at the Iduapriem mine. The appointment also included the compilation of an emissions inventory and atmospheric dispersion modelling of the facility.

#### **Day and Night Annual Noise Monitoring. Valtterra Platinum Mpumalanga (2025)**

Annual monitoring of night and day Noise at Der Brochen, Mototolo, Concentrator, Borwa and Lebowa shafts using a standard Sound Level Meter. Compilation of annual noise report for all sites.

#### **Air and Noise Baseline Assessment. ACWA POWER Mpumalanga (2025)**

Appointment to develop, install and manage an air quality monitoring network (dust fallout, continuous particulate and passive gas monitoring) at a facility in Mpumalanga Secunda, near the SASOL facilities.

## **Stack Sampler (2015-2024)**

Since 2015, Matthew has travelled all over South Africa and some neighboring countries across all Industry conducting point source emissions tests as stipulated in section 21 and 23 of the South African National Environmental Management Air Quality Act (NEMAQA).

## **Experience**

Proficient in stack emissions testing, fence-line monitoring (including dust fallout and passive diffusive sampling) and leak detection and repair (LDAR).

- Application of United States' EPA methods and South Africa's NEM: AQA 39 of 2004 in stack emissions testing for compliance purposes.
- Operating and troubleshooting of emissions testing equipment (Dado ST5, Tecora Isostack ST4, Testos, J2KNs, MRUs, Eneracs, H2S to SO2 furnace/rigs)
- Management of equipment logistics
- Assessment of client processes and operations
- Testing Campaign Project Management
- Sample and data analysis
- QA/QC

## **Experience and execution of the following sampling methods:**

Niosh 1604, Niosh 2010, Niosh 5515, Osha 40.

Epa 0031, Epa 1-3, Epa 4&5, Epa 6-10, Epa 12, Epa 16c, Epa 18, Epa 21, Epa 23a, Epa 25b, Epa 101a, Epa 26a, Epa 29, Epa316, Epa 325b.

Carb 429