

Bowline
Professional
Services

COMPANY PROFILE AND SERVICE OFFERING

Prepared by
BOWLINE PROFESSIONAL SERVICES (PTY) LTD



1. INTRODUCTION

Bowline Professional Services (Pty) Ltd is an **independent mining consulting** company based in Johannesburg, South Africa. Our management team consists of mining engineers and geology experts with extensive project management experience.

Bowline's Directors have many years of combined experience in a variety of commodities including Platinum, Gold, Diamonds, Coal, Uranium, Chrome, Rare Earths, Nickel, Copper, Iron Ore to name a few. They have worked for **large, medium and small scale** companies in **production, project consulting, engineering, financial** and various other business areas managing projects, departments and divisions as business units. Each required either project (or operational) office administration, marketing, networking, project/proposal management, HR considerations and budget, time and quality management. More recently we have also been involved with **asset valuations** for various business rescue and liquidation practitioners; and business plan development for start-up businesses in other non-mining related engineering service industries.

Even though the Directors are **mining and geology specialists** by training they have developed skills suitable for **general management, business administration and project management** and are more than capable of operating in any engineering environment, not only mining.

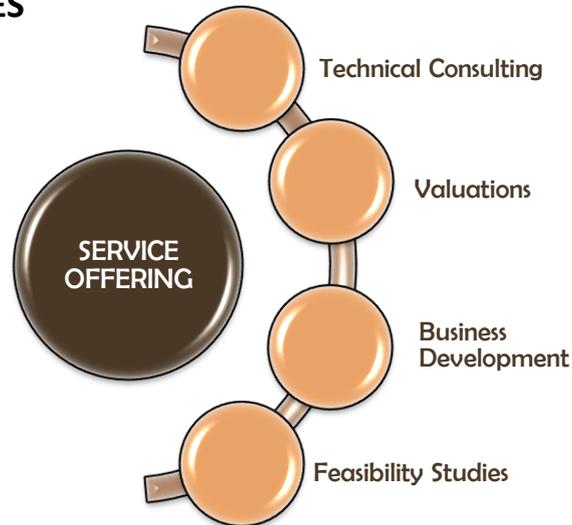
The Bowline team has over **80 years combined experience** of management across the mine to market value chain and are capable of handling the project life cycle from exploration through feasibility studies and project implementation.

Bowline predominantly aims to serve:

- Mining companies
- State owned mining companies
- Private mineral asset owners
- Engineering houses and consulting firms
- Business rescue / liquidation outfits



2. COMPANY ACTIVITIES



Bowline typically gets involved with the following activities:

- Mineral Asset Transactions and associated Technical-Economic Advisory
- Mine operations
- Project management
- Mining engineering
- Rock engineering
- Process engineering
- Mineral asset valuations
- Due diligences
- Feasibility studies
- Asset valuations
- EPCM contracts
- Business plan developments
- Owners project team management



3. OUR DIFFERENTIATOR

Bowline's company strategy is to competitively operate with sufficient staff contingents which allows us the flexibility to successfully manage the cost structure of projects and allows us to expertly execute projects in a timely fashion. Bowline has strong strategic alliances with similar like-minded companies that allow us to address all areas of the mining value chain.

Clients deal directly with company decision makers at all times. Bowline is sufficiently flexible to accommodate different pricing models (fee structures) which are addressed on a project by project basis. Generally, we offer a fixed price per project as opposed to following a traditional cost reimbursable model. Bowline gets involved much earlier in the project life cycle and is prepared to stay on into the mine operation phase.

4. MANAGEMENT TEAM

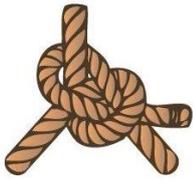
BRETON SCOTT: MANAGING DIRECTOR



Breton has 2 decades' post-qualification experience in the mining and project engineering industry. He has been involved in a variety of activities ranging from mine operations, project management, mining and rock engineering, mineral asset valuations, mineral asset transactions, independent due diligences and reviews, EPCM contracts and related feasibility studies.

Over the past 13 years, whilst in the project consulting and engineering industry (excluding production experience) Breton has systematically built significant experience in managing projects, departments and divisions as business units. Each required office administration, marketing, networking, proposal management, HR considerations and budget, time and quality management. Even though Breton is a mining engineer by training, he has developed skills suitable for general management, business administration and project management. He is capable of operating in any engineering environment, not only mining. (Examples include process plants, water treatment plants, business advisory to other consulting engineering practices etc.).

He has extensive experience in a variety of commodities, including gold, platinum, coal, base metals, iron ore, nickel, copper, rare earths, uranium to name a few. More recently, Breton has also been involved with asset valuations for various business rescue and liquidation practitioners and business plan development for start-up businesses in other non-mining related engineering service industries



ROB PATTERSON – CONSULTING ENGINEER



Rob is a fully qualified diploma Mining Engineer with extensive International, Commercial and Technical experience in a wide diversity of mining related environments. He has demonstrated his ability to rationalise Project Management & Project Services for improved productivity and profitability. Rob has over 40 years' experience in the preparation of estimates, tenders, the purchasing of the equipment and the project management and control for large-scale surface and underground mining operations. He has been involved with the preparation of NI 43-101 Technical reports and LoM planning and he is experienced in freight logistics and trading in African and the Middle East countries. Most recently Rob has been project managing as the client's representative on a significant gold project and a uranium project; both of them incorporating the metallurgical and tailings facility, diesel generator banks and the Mine infrastructure.

DR NICOLAAS CASPER STEENKAMP – CONSULTING GEOLOGIST



Dr Nicolaas C. Steenkamp works as a Geologist and Business Analyst and has over 12 years of experience in a broad range of fields. Nicolaas obtained a PhD in Geology at the University of Pretoria and is a registered PrSciNat with SACNASP. He is also a member of the GSSA, SASS and SAIMM.

He is involved in contractor management, geological, geotechnical and geometallurgical project work and studies. Dr Steenkamp has a background in the geological field that includes, but is not limited to: Geological- and geotechnical core logging, underground face mapping, regional surface mapping, greenfields- and brownfields exploration. He has also been involved in technical reporting, due diligence and desktop studies. He also has a background in X-ray analytical methods, specifically EMP and XRF. He was most recently involved in a shaft sinking and decline rehabilitation project where a unique set of geological and geotechnical challenges are faced in terms of development through sand and stiff clays.

ANTHONY JAMIESON – ENGINEERING MANAGER



Anthony has been in the engineering fraternity for 3 decades and has skills in the management and execution of Projects, ensuring effective coordination of the respective staff within the Project environment. He has extensive experience in planning, directing, coordinating and budgeting of the activities concerning the construction and maintenance of Construction Projects, as well as overseeing the Project organization, scheduling and Implementation. In particular, he has skills for the verification of construction structures, the coordination of the control of material and equipment inventory, monitoring the usage of materials in relation to the Project Plan and managing the relevant Quantity Surveyors. In addition, he is proficient in the development and implementation of SHEQ policies and Risk Management Plans.



ARAYAN GOVINDASAMY – ASSOCIATE CONSULTING ENGINEER



Arayan is a qualified BSc Mechanical Engineer and is registered as a Project Management Professional (PMP) through the Project Management Institute in the USA. He has worked as a Mechanical Engineer since graduation in 2006. He has extensive experience in both mechanical engineering and project management for high value capital projects in both the Petro-Chemical as well as the Mining environments. This includes managing local and international EPCM/EPC projects from conceptualisation right through to commissioning and operation.

5. PROJECT APPROACH / METHODOLOGY

“Mine in a Box” is a BOWLINE solution to assist predominantly small to medium scale miners realise revenue from their projects faster and at a reduced cost. It allows a mining project to start small, generate initial revenues and then over time recapitalise and grow, introducing additional infrastructure and systematically building the operation up to an economy of scale that meets longer term business strategies and job creation.

BOWLINE has the resources to conduct exploration programmes, feasibility studies, infrastructure designs as well as construction/project execution. In addition, we can carry out environmental studies, mining and prospecting license applications as well as any other legal/permit requirements that may be needed.

The “Mine in a Box” solution, fast tracks (without short cuts) the design and development processes to bring a small scale mine into production as early as possible. We utilise off-the-shelf modular process plant technology that minimises the need for third party engineering design. The modular nature of the process plants allows additional plant modules to be added should an upgrade in production be required.

Through BOWLINE, the “Mine in a Box” solution also includes the means to raise the necessary finance (as well as any other off-mine logistics and off-take agreements) as and when required.

BOWLINE can offer contract mining and process plant toll treatment facilities (e.g. build, own, train and transfer, rent to own) to assist with reducing the overall capital requirements. In other words, should our clients need assistance with the management of actual operations, BOWLINE can assist. We typically adopt a strategy whereby the project development team stays with the project to assist with the initial production ramp up and any skills development/transfer to ensure the sustainability of the operation after the project execution.

Owing to the nature of small scale mining operations, it is effectively only the exploration/prospecting work, metallurgical test work, environmental impact assessments, tailings storage facilities and other legal obligations that will dictate the overall project execution



timeline. (This is usually where the biggest risks exist and the work should be conducted and signed-off by competent and registered professionals to mitigate these risks.)

Depending on the status and stage of development of any given project, the process of taking a project from inception to production could range between 12 and 24 months.

The “Mine in a Box” solution typically covers projects that range from US\$300,000.00 to US\$30,000,000.00.

Our approach when presented with potential opportunities, is to initially conduct a high level review/assessment of the opportunity to establish its stage of project development and to design the way forward, i.e. is there further exploration work, feasibility studies, procurement of equipment or compliance of legal permitting required, etc. These high level reviews can take between 4 to 8 weeks to complete depending on the amount of information available for review and where possible, should include a site visit.

Each project is resourced on a “fit-for-purpose” basis whereby only the necessary resources are brought in as and when required. This reduces overheads and thus presents a more cost effective approach than most other larger consulting companies.

Bowline has a number of key strategic partners that are sub-contracted in specifically for each project where it cannot be handled in-house.

These may include:

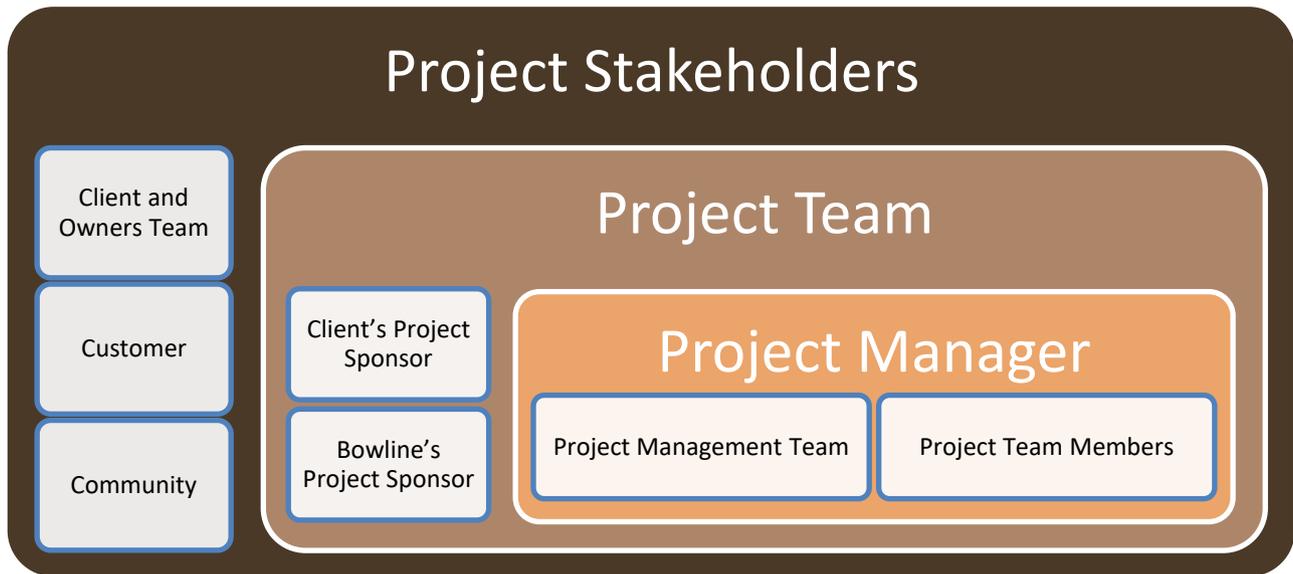
- Commodity specific expertise - Geology
- Commodity specific expertise - Mine Planning
- Environmental

Bowline also has large global engineering and construction companies that it calls upon when additional resources are required.

Below illustrates a typical project structure:



Project Stakeholders



Bowline typically uses a multi-phase approach including multiple levels of gathering and processing of data and the use of this data to provide varying levels of design and plans; then further defining a detailed way forward with required stage gate checks at the end of each phase.

PHASE 1: Literature Review, Basic Geological Understanding and Way-Forward Strategy

This phase consists of a full literature review, basic geological understanding and way-forward strategy. The main aim will be to define the best use of the available information, identify the best target property to focus on, and define a way-forward strategy that can best be deployed in order to suit the short term needs of the project; and to realise early returns from this mineral deposit.

The general scope of work is as follows:

- A review of existing data provided by The Client, and an attempt to acquire further data from sources including the national and/or local offices of the Geological Survey, local knowledge and/or other sources of information in the public domain.
- Basic Geological review and identification of target areas with best possibility of earliest delivery of return as well as identifying areas for further drilling and/or trenching.
- Conduct a site visit to the project areas and surrounding areas to establish historical geological and/or production data; ground conditions to be expected for earlyworks; as well as the presence of any artisanal mining
- Compiling of Way-Forward strategy and options analysis to define the best strategy for The Client to realise value. This will include a statement of any additional information required (or to be generated), such as additional geology, metallurgy and testwork, environmental considerations, legals and permitting etc.
- To further identify the main stage gates for early project development, as well as the greater project development for a larger more sustainable operation; and detail these options.
- To briefly define potential investment opportunities available and how to progress with these through each of the future phases.
- High-Level techno-financial model including capex, opex and technical/economic analysis



PHASE 2: Geological Definition, Feasibility Study and Mining Licence Application

This phase of the project will define the geological resource on the targeted property and then complete a high level feasibility study and, in parallel, the environmental study process.

In detail, this will include:

- Geology including drilling, trenching, resource definition and metallurgical test work
- Mining including mining method statement, mine design and equipment selection
- Processing including process philosophy, design and equipment selection
- Infrastructure on mine, off mine as well as tailings storage facility
- Techno-Financial Model including Capex, Opex and Technical/Economic analysis
- Environmental base line assessment, specialist studies, impact assessment and water use licence
- Mining Licence Applications (The actual application will be the responsibility of the asset owner)

This phase could take approximately 6 to 12 months to complete, with the longest duration being the Environmental seasonal baseline assessments and specialist studies. This phase is estimated between US\$1 million and US\$2 million depending on scale of drilling and/or other requirements that will be defined in phase 1.

During this phase of the project it is suggested that a pilot plant be implemented as part of a bulk sampling process and also to initiate a revenue stream. The budget cost for this pilot plant, i.e. capital and some initial working capital, would be in the order of US\$0.5 million to US\$1.5 million. It is anticipated that a pilot plant campaign would need to be in operation for a minimum of 12 months to generate sufficient revenues to cover costs incurred and potentially generate some profits.

PHASE 3: Project Implementation

The implementation phase of this project will involve the finalisation of engineering (through the respective equipment suppliers); procurement of contractors and suppliers; and the construction management for developing the project into a larger more sustainable operation.

It is difficult to estimate a capital cost for this phase of the project, without conduct the previous two phases. However, in Bowline's experience when considering a relatively small scale operation, and then ramping up through our "Mine in the Box" concept, a project may suit anything from a 10 to a 30 tonne per hour process plant (with potentially varying metallurgical process stages and other complexities that would be project specific).

This could result in an approximate indicative capital cost of US\$10 million to US\$30 million. As already mentioned, this cost cannot be validated until Phase 1 and Phase 2 has been completed.



6. COMPANY EXPERIENCE – Selected Projects

YEAR	PROJECT NAME	PROJECT TYPE	COMMODITY/INDUSTRY	COUNTRY
2014	Ergosat Coal Proposal to Eskom	Business Case Study	Coal	South Africa
2013	Sudor Due Diligence	Due Diligence	Coal	South Africa
2013	Brakfontein Techno-Economic Review	Due Diligence	Coal	South Africa
2014	Sudor Coal CPR and MRE	Independent Technical Report	Coal	South Africa
2015	Sudor Coal CPR and MRE update	Independent Technical Report	Coal	South Africa
2017	Nndanganeni Colliery	Mine Operations – Mine Management Contract	Coal	South Africa
2015	Nigeria Agricultural Projects	Project Management	Agricultural Infrastructure Projects	Nigeria
2016	SPMP Oman Project	Project Management	Antimony	Oman
2014	High Level Mine Plan	Advisory	Barites	Kenya
2013	Mooihoek Chrome Business Rescue	Valuation	Chrome	South Africa
2015	Charisma Clay Mine Business Plan	Business Case Study	Clay	South Africa
2014	Musina Copper Dumps Business Plan	Business Case Study	Copper	South Africa
2016	Limited Review of Gecamines JVs	Due Diligence	Copper	DRC
2015	Moroccoa Desktop Study	Business Case Study	Copper, Silver	Morocco
2015	Opinion Letter and Review	Advisory	Diamonds	South Africa
2014	Mogale Gold Krugersdorp	Advisory	Gold	South Africa
2013	Gold Mine in Kenya	Concept Study	Gold	Kenya
2017	Jolly Boys Desktop Study	Concept Study	Gold	Zimbabwe
2014	Giyani Gold Project	Due Diligence	Gold	South Africa
2014	Tarill Gold Project Zimbabwe	Due Diligence	Gold	Zimbabwe
2014	Wafi Gold Project	Project Management	Gold	Papua New Guinea
2015	Kibali Desliming Cyclone SMPP	Project Management	Gold	DRC
2014	Management of Doornhoek Mine	Small-scale Mine Development	Gold	South Africa
2014	Giyani Gold Project Phase 2A	Small-scale Mine Development	Gold	South Africa
2015	Sudan Gold Mining Project	Small-scale Mine Development	Gold	Sudan
2015	Anesu Gold Mine	Small-scale Mine Development	Gold	Zimbabwe
2013	Blyvooruitzicht Mine Valuation	Valuation	Gold	South Africa
2014	Kilamapesa Valuation	Valuation	Gold	Kenya
2016	NI43-101 Report, Concept Study & Prospecting	Independent Technical Report	Graphite	Tanzania
2013	Business Plan Development	Advisory	HVAC	South Africa
2014	Business Plan Updates	Advisory	HVAC	South Africa
2016	Company Valuation	Valuation	HVAC	South Africa
2013	DK Business Plan	Advisory	ICT	South Africa



2015	Guinea Infrastructure Projects	Project Management	Infrastructure, Power Plant, Roads, Housing	Guinea
2013	London Mining ITR update	Independent Technical Report	Iron	Sierra Leone
2014	London Mining March 14 update	Independent Technical Report	Iron	Sierra Leone
2017	MOU Preparation	Advisory	Marketing, Cleaning Products	South Africa
2017	Company Valuation	Valuation	Medical	South Africa
2017	Valuation of Shareholding	Valuation	Phosphates	South Africa
2017	VCC Model Review	Advisory	Rock support products	South Africa
2014	Business and Project Management Assistance	Advisory	SME's	South Africa
2014	Advanced Workplace Upskilling Workshop	Advisory	Student engineers	South Africa
2013	Avalloy Business Rescue	Valuation	Super Alloys	South Africa
2015	Water Treatment Plant (Newmont in Ghana)	Project Management	Water	Ghana
2017	Vedanta Gamsberg Project	Advisory	Zinc, Lead	South Africa

**Thank you,
Team Bowline**

For more information please contact us

Office Address:

Unit 10, Block A, Entrance 3
Wild Fig Business Park
1494 Cranberry Street
Honeydew
2040.

Telephone Numbers:

Office: +27 11 027 0403
Breton: +27 82 788 9243

GPS Information:

Latitude: 26° 04' 40.8" S
Longitude: 27° 55' 31.2" E
For copy & paste into Google maps / GPS etc.: S26.077999, E27.925341

