

## **Invitation for Proposals**

### **Seismic acquisition and/or acquisition of any other geophysical, geological, or geochemical data, onshore South Africa**

#### **1 Introduction**

South Africa is currently preparing for the release of open acreage onshore under license rounds to be scheduled following the enactment of the Upstream Petroleum Resources Development Bill (UPRDB), 2021, currently before Parliament. While committed to achieve carbon neutrality by 2050, it remains the Government of South Africa's stated policy and desire to develop the country's indigenous natural gas and oil resources to ensure national energy security, stability, and economic development. South Africa is on a clear path to respond to national developmental imperatives by exploring, discovering, quantifying and developing its indigenous petroleum resources in an environmentally sustainable and responsible manner.

In pursuance of sustainable development of South Africa's onshore petroleum resources that is likely to require hydraulic fracturing of the gas bearing zones, the Department of Forestry, Fisheries, and the Environment recently published regulations for hydraulic fracturing for public consultation in terms of the National Environmental Management Act.

The Department of Mineral Resources and Energy hereby invites proposals from seismic acquisition, seismic processing or any other companies involved in exploration data acquisition or enhancement, to enter into an agreement with the Petroleum Agency South Africa ("PASA" or "the Agency") for data acquisition and/or enhancement over all or any of the areas shown below. The new datasets will be released as part of a licensing round program and be a mandatory purchase for prospective bidders as part of the bid package, timing and terms are to be negotiated.

Open areas for release under license round to be held in terms of the new Act have been identified. The proposals for data acquisition and processing may include one or both areas shown in Figure 1 which forms part of the greater Karoo Basin. Other data acquisition survey proposals such as gravity and magnetic surveys, magneto telluric surveys and/or geochemical surveys will also be considered.

Activities relating to the acquisition of new data shall be undertaken at the risk of the Company proposing such activities in response to this invitation for proposals. Successful Companies bidding on the acquisition and processing of new data will be required to apply for, and be granted a reconnaissance permit to conduct operations in the proposed areas.

The State through the Petroleum Agency SA will consider contributing to the cost of the work program and share in the financial risk exposure of the project. The nature and quantum of this contribution to costs will be the subject of negotiation between the Agency and successful bidding Company(ies). PASA will remain the rightful owner of the newly acquired data, whilst the Company will be granted shared marketing rights for a period of ten years, renewable by agreement. Terms and conditions relating to profit sharing and skills transfer will be discussed with the Companies that submit proposals and shall form part of an agreement to be entered into between the selected Company and PASA.

PASA shall host a non-compulsory briefing session for this invitation for proposals. Interested parties are therefore requested to register to receive communication regarding this invitation for proposals by sending an email to [onshoresurvey@petroleumagencysa.com](mailto:onshoresurvey@petroleumagencysa.com).

Proposals to acquire and/or process seismic data will be evaluated in line with the scoring schedules included below. Proposals for any other type of data acquisition will be evaluated on their respective merits.

## 2 Project Objectives

The Department of Mineral Resources and Energy (the Department) through PASA is evaluating and promoting South Africa's frontier onshore for petroleum. In this quest, Petroleum Agency SA seeks to engage a competent Company for the following:

- 2.1. Acquire new 2D land seismic data over one or both areas identified to obtain modern high-resolution subsurface seismic images to map and improve understanding of the regional geology of the subterranean south-central Karoo Basin. Imaging objectives include improved delineation of structures, faults, fault

closures, stratigraphic traps, fluid escape features, dolerite sill and dyke complexes within Beaufort and Ecca groups of the Karoo Supergroup compared to the legacy data.

- 2.2. Processing of the newly acquired data and compiling data packages that will be offered for sale to companies interested to evaluate the area(s) using a licensing framework that provides cost recovery mechanisms for the Company inclusive of a profit-sharing arrangement from the data sales with PASA.
- 2.3. Supporting PASA and the Department in brokering and marketing the data prior to and after the licensing and any specialized reprocessing that may be required by the licensees of any block.
- 2.4. An initial regional interpretation of the data to demonstrate the prospectivity of each block and rank their relative value.
- 2.5. Engaging PASA staff in the acquisition, processing, and interpretation of the newly acquired data as an integral part of technology transfer and capacity building.

### **3 Proposals for Data Acquisition and Processing**

Proposals will be accepted at the discretion of the Petroleum Agency SA.

There are two (2) license areas for which Companies may send proposals for data acquisition and processing. Companies may submit proposals for one or both of the planned license blocks.

Companies submitting successful data acquisition proposals will be required to apply for a reconnaissance permit and Environmental Authorisation in terms of the Mineral and Petroleum Resources Development Act, 28 of 2002 read together with the National Environmental Management Act, 107 of 1998.

The areas/blocks for the preparation of proposals are described below.

#### 4 Description of the Onshore Planned License Areas

The area is situated in the southern part of the Karoo Basin and is subdivided into two large regions; a western area, Block A (~162 000km<sup>2</sup>) and an eastern area, Block B (~57 000km<sup>2</sup>). The total licence area is ~219 000 km<sup>2</sup> but may be divided into smaller areas for the purposes of a proposal (*Figure 1*).

The areas are sparsely covered by single fold 2D seismic data acquired in the 1960s and 70's. The seismic data available over the areas is only available in digital analogue format (scans/vectorised versions of the original seismic profiles) and the quality is generally poor.

Aero-magnetic data over the identified areas were collected during the national aeromagnetic survey for South Africa between the years 1958 and 1997. It was flown in two primary sections – the Karoo survey, done between 1976 and 1982 and covering almost half of the country; and the rest, which was surveyed by various Companies over a period of more than 30 years, starting in 1958 and ending in 1997.

In Block A, there are 13 wells/stratigraphic boreholes, drilled between 1965 and 2020, with an average depth >3000m. In Block B there are two deep wells with an average depth ~3500m. All wells intersected the organic-rich shale (likely source rocks) of the Permian Ecca Group.

Results from some of the exploration wells indicate that no oil was observed, but drill stem tests and water analyses indicate the presence of methane, ethane and small amounts of propane. In Block A, high-pressure low-volume gas shows were encountered in the southern Karoo Basin and as an example, the well CR 1/68 had methane gas flowing out of fractured Upper Ecca shales. In Block B, groundwater research performed on the deep stratigraphic research borehole sampled black fluid with a strong petroleum smell. Methane was also identified to be leaking from the borehole.

Further analysis on the organic-rich shales of the Permian Ecca Group indicates that the shales are likely Type I/II source rocks and have TOC values that range from 2 – 16 wt%, but very high maturities (from 1% to > 4% VRO).

The area is broadly regarded as frontier in respect of oil and gas exploration. However, based on historical data and information, internal archives and public data, the area has both oil and gas shows at surface. Gas occurrences in association with dolerite sills have been observed in the Beaufort Group and also in the Ecca Group in water wells and deep exploration wells without the presence of dolerite sills. Also, the area Block B hold the Molteno Coal deposits that could be prospective for CBM.

In terms of infrastructure, the area is serviced by a road network consisting of both highways and main roads that are owned and maintained by the South African National Roads Agency (*Figure 2*). Furthermore, the areas are within 100-400km of air and seaports of Cape Town, George (air), Mossel Bay (sea), East London (air and seaports), Ngqura (seaport), Port Elizabeth (air and seaports) and Durban (air and seaports). The Ngqura (Coega) Industrial Development Zone (IDZ) is one of the selected sites for the development of a 1000MW Gas to Power Station. The land within the license blocks consists of privately owned farmlands, commonage land and communal land managed by tribal authorities.

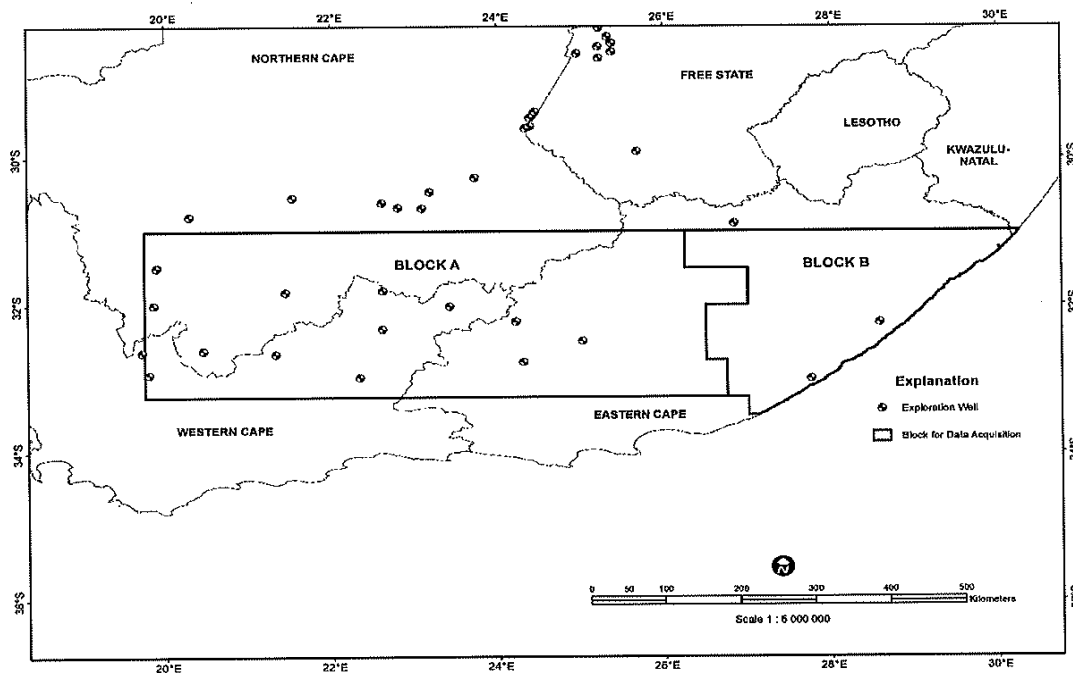


Fig 1: Onshore areas/blocks for new 2D seismic and geophysical data acquisition.



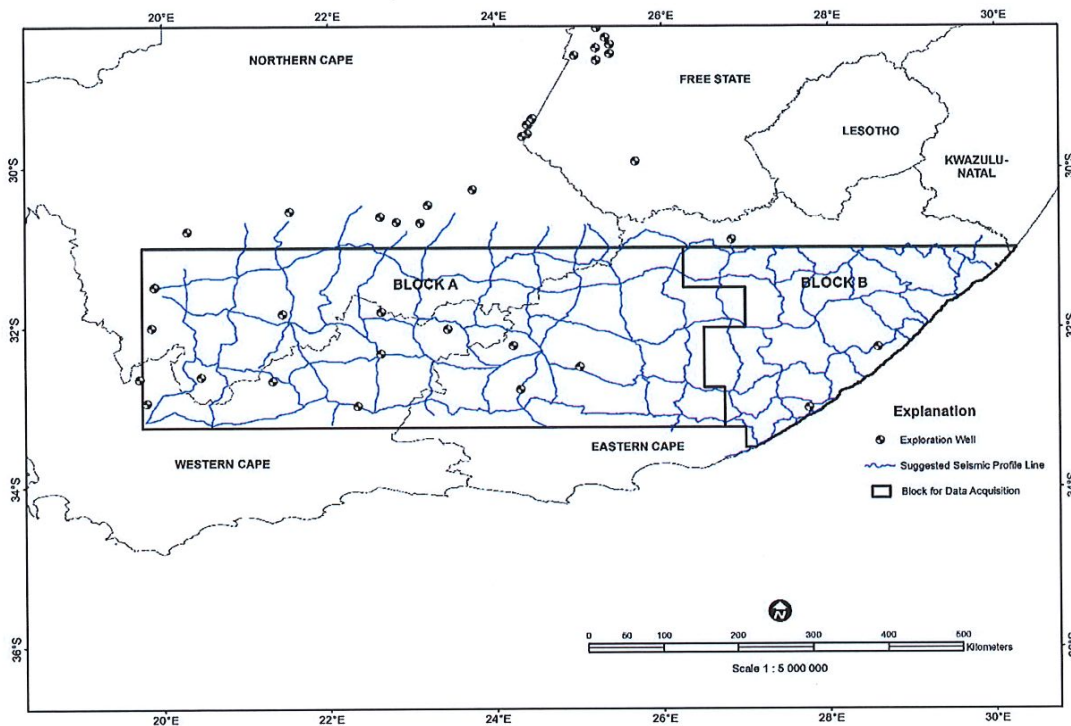


Fig 2: Suggested profile lines for 2D seismic and geophysical data acquisition along existing roads.

## 5 Submission of Proposals

Companies wishing to submit proposals may do so for one or both of the areas described above.

Proposals must clearly demonstrate a good understanding on the part of the proposing Company of what is required including the permitting process and nature of agreement to be entered into with Petroleum Agency SA, as well as the timeline involved in return on the investment to be made.

The new data acquired under these proposals are to be released as part of the licence round package for these areas. This will only be possible once the UPRD bill is enacted. In addition, the successful proposing Company will be required to apply for a reconnaissance permit following all the normal requirements, including environmental authorisation for seismic or other new data acquisition at the sole risk of the successful Company.

In addition to demonstrating a good understanding of what is required, the following are required.

## **6 Requirements of Proposals for New Data Acquisition and Processing**

### **6.1 Seismic Acquisition**

- 6.1.1 The Company will be required to provide the seismic data acquisition and processing technology it intends to deploy in the survey. A comprehensive overview and description of the field equipment, redundancy (back-ups) of equipment and logistics consideration during acquisition given the large areal extent must be issued as part of the proposal submitted.
- 6.1.2 Companies will be permitted to visit data rooms at PASA to view existing data to enable them to review and propose the total number of line kilometers and develop an initial field operations plan. The production efficiency of the proposed survey design considered with the extent of the coverage as indicated by the planned total number of line kilometers will be important criteria in evaluating the proposals received.
- 6.1.3 Whilst the start date of the project remains unclarified, a conceptual time frame for the acquisition program, including, but not limited to, considerations such as mobilization duration, pre-survey compliance inspections, daily on-line production targets, statics survey production, planned downtime and equipment maintenance, logistics to ensure efficient operations over such a large area, etc. is required and will form a criterion for evaluating proposals.
- 6.1.4 The Company is required to provide an indicative cost of the survey based on (6.1.1, 6.1.2 and 6.1.3) which will also inform initial proposals for cost and revenue share agreements between the Company and PASA.
- 6.1.5 The Company should demonstrate a full understanding of, and compliance to internationally accepted Health, Safety, Environmental and Quality policies, practices and procedures while carrying out seismic/geophysical data operations.

6.1.6 Temporary work opportunities that could be provided for locals during field operations must be indicated.

## **6.2 Processing Requirements**

The following information regarding the processing of the data must be specified as a minimum in the proposal:

6.2.1 The Company is required to have sufficient personnel, equipment, management and highly effective QA/QC procedures and organizational processes to conduct the works as required.

6.2.2 An initial (expected) processing sequence to process the data must be specified.

6.2.3 The parameter testing philosophy of the company must be clarified i.e., the extent to which additional parameter trials to improve data fidelity are accommodated in the processing of the data.

6.2.4 The company should clarify how PASA personnel would be provided opportunities for skills transfer during the parameterization trials and processing QC.

6.2.5 Only Companies complying with these requirements and demonstrating successful track record, listing projects, clients and provide client contacts details for reference should respond to this invitation for proposal.

## **6.3 Other Requirements**

The Company should have proven experience of land 2D Vibroseis multi-client Seismic Data Acquisition and /or processing on schedule within specific timelines.



In addition, Companies are required to submit the following for both acquisition and processing:

- 6.3.1 Conceptually provide the earliest timeframe of 2D seismic crew mobilization availability (for example – from date of contract award).
- 6.3.2 Lists of similar 2D land seismic data acquisition work undertaken successfully in the last five years and projects currently under execution.
- 6.3.3 Details of any previous experience of a similar type in South Africa.
- 6.3.4 Details of key personnel proposed to be involved in the project including their bio-data.
- 6.3.5 Management structure of the company.
- 6.3.6 Operational QA/QC procedures: acquisition and processing.
- 6.3.7 Health, Safety and Environment policies, procedures and statistics covering the last 3 years.
- 6.3.8 Company's financial performance documents (Audited Balance Sheets and Profit and Loss Statements etc.) for last 3 years.
- 6.3.9 Project plan, timeline, and description of project deliverables.
- 6.3.10 Any other relevant information.

## 7 Evaluation schedules and weightings

### 7.3 Onshore Evaluation Criteria Summary

	<b>Onshore Evaluation Criteria</b>	<b>Contribution</b>
7.3.1	Quality of proposal ( <i>Overall understanding and meeting scope of requirements</i> )	20%
7.3.2	Profit sharing mechanism proposed.	15%
7.3.3	Skills transfer / training opportunities proposed.	15%
7.3.4	Non-proprietary / speculative surveys experience	10%
7.3.5	Acquisition Technology	10%
7.3.6	Processing Technology	10%
7.3.7	2D surveys > 1 000km <u>acquired and processed</u> in last 5 years	5%
7.3.8	Client feedback gathered from references provided	5%
7.3.9	Company SHEQ / ISO certification	5%
7.3.10	Acquisition and processing project plan	5%

### 7.3.1 Quality of Proposal

20%	Quality of Proposal
	<ul style="list-style-type: none"> <li>Overall commitment, understanding and meeting scope of requirements, being to obtain modern high-resolution imagery that improves on the imaging provided by the legacy data to map and understand regionally the geology of the subterranean south-central Karoo Basin.</li> </ul>
Score	Evaluation targets
5	<ul style="list-style-type: none"> <li>Excellent proposal - The important issues are approached in an innovative and efficient way, indicating that the bidder has the required knowledge of state-of-the-art approaches to successful acquisition and processing projects.</li> <li>Proposed project execution plan is tailored to address the project objectives, and sufficiently flexible to accommodate changes that may occur during execution.</li> <li>The quality and risk management plans plan are tailored to the critical characteristics of the project.</li> <li>The primary objectives and key success factors are identified and to be pursued in an efficient way using state-of-the-art methodologies and technologies.</li> <li>The proposed approach details ways to improve the project outcomes and quality of the outputs.</li> </ul>
4	<ul style="list-style-type: none"> <li>Very good proposal</li> <li>Proposed project execution plan is tailored to address specific project objectives and methodology, and is sufficiently flexible to accommodate changes that may occur during execution.</li> <li>The quality plan and approach to managing risk etc. are tailored to the critical characteristics of the project.</li> </ul>
3	<ul style="list-style-type: none"> <li>Good proposal</li> <li>Proposed project execution plan is satisfactory and partially tailored to address the project objectives.</li> <li>The approach minimally deals with the critical characteristics of the project.</li> <li>The quality plan, and approach to managing risk etc. are compliant with project specifications.</li> </ul>

2	<ul style="list-style-type: none"> <li>• Average proposal</li> <li>• Proposed project execution plan is of a generic nature and not necessarily tailored to address the project objectives.</li> <li>• The approach does not meaningfully deal with the critical characteristics of the project.</li> <li>• The quality plan, and approach to managing risk etc. are generic.</li> </ul>
1	<ul style="list-style-type: none"> <li>• Poor proposal</li> <li>• The proposed project execution plan is poor and unlikely to satisfy project objectives and requirements.</li> <li>• The company has misunderstood certain aspects of the scope of work and therefore does not deal with the critical aspects of the project.</li> </ul>
Eliminated	No technical proposal submitted by the company

### 7.3.2 Profit-sharing

<b>15%</b>	<b>Profit-sharing mechanism proposed.</b>
	<ul style="list-style-type: none"> <li>• <i>The profit-sharing mechanisms proposed in bids will be ranked against each other and the rank fitted into the 5-point scale with 5 being the most attractive and 1 the least attractive.</i></li> <li>• <i>Different bidders' profit-sharing proposals may be ranked as equally attractive, or not, and be awarded the same evaluation score.</i></li> <li>• <i>The profit-sharing scheme will be a subject for further negotiation upon identifying preferred bidders.</i></li> </ul>
<b>Score</b>	<b>Evaluation targets</b>
5	Most attractive initial profit-sharing proposal
:	Ranking fitted
:	
1	Least attractive initial profit-sharing proposal
0	Ignored requirement

### 7.3.3 Skills Transfer and Training opportunities

<b>15%</b>	<b>Skills transfer and training opportunities.</b>
	<ul style="list-style-type: none"> <li>• The training and experience opportunities proposed in bids will be ranked against each other and the rank fitted into the 5-point scale with 5 being the most attractive and 1 the least attractive.</li> <li>• Different bidders' skills transfer proposals may be ranked as equally attractive, or not, and be awarded the same evaluation score.</li> <li>• The training and experience opportunities during work program execution will be a subject for further negotiation during contract negotiations.</li> </ul>
<b>Score</b>	<b>Evaluation targets</b>
5	Most attractive training and experience exposure proposal
:	Ranking fitted
:	
1	Least attractive training and experience exposure proposal
0	Ignored requirement

### 7.3.4 Non-proprietary survey experience

<b>10%</b>	<b>Non-proprietary / speculative surveys experience</b>
<i>Scores of 1 or 3 not provided for in this criterion</i>	
<b>Score</b>	<b>Evaluation targets</b>
5	<ul style="list-style-type: none"> <li>• Bidder <u>has demonstrated track record</u> of successfully acquiring, processing, promoting and licensing non-proprietary, multi-client onshore 2D seismic data during the last 5 years.</li> <li>• Bidder has provided contactable references to support track record.</li> <li>• Bidder's contactable references include African NOCs and African Oil and Gas sector regulators.</li> </ul>
4	<ul style="list-style-type: none"> <li>• Bidder <u>has demonstrated track record</u> of acquiring, processing, promoting and licensing non-proprietary, multi-client seismic data successfully during the last 5 years.</li> <li>• Bidder has provided contactable references to support track record.</li> </ul>
2	<ul style="list-style-type: none"> <li>• Bidder <u>has provided a list</u> of acquisition, processing, promoting and licensing of non-proprietary, multi-client seismic data projects during the last 5 years.</li> </ul>
0	Bidder has not provided a list of projects



### 7.3.5 Acquisition Technology, equipment and personnel

10%	Acquisition Technology, Equipment and Personnel
	<ul style="list-style-type: none"> <li>• 2D acquisition technology offered</li> <li>• Availability of in-field QC processing capabilities</li> <li>• Willingness demonstrated to improve on existing seismic imaging of Karoo basin</li> <li>• Technical support available to field crew</li> <li>• Average experiences of party chiefs in Company</li> </ul>
Scores of 1 or 3 not provided for in this criterion	
Score	Evaluation targets
5	<ul style="list-style-type: none"> <li>• Proposal demonstrates that local imaging challenges and the acoustic nature of the sedimentary sequences of the Karoo basin is understood</li> <li>• Bidding document provides comprehensive proposals to mitigate expected imaging challenges such as, but not limited to field parametrisation trials for every area (source and receiver array configurations, sweep lengths, sweep frequencies, near surface static determination, etc.)</li> <li>• Comprehensive list of in-field acquisition equipment, including levels of key equipment redundancy, mechanical and electronic maintenance support available in (or near) field operations</li> <li>• Proposal includes case histories of in field seismic QC and QA with examples of quality criteria used in the field. QA procedures also include preliminary/fast-track stacks of newly acquired lines processed in field.</li> <li>• Average experience of current party chiefs &gt; 10 years</li> </ul>
4	<ul style="list-style-type: none"> <li>• Proposal demonstrates that local imaging challenges and the acoustic nature of the sedimentary sequences of the Karoo basin is understood</li> <li>• Bidding document provides comprehensive proposals to mitigate expected imaging challenges such as, but not limited to field parametrisation trials for every area (source and receiver array configurations, sweep lengths, sweep frequencies, near surface static determination, etc.)</li> <li>• Comprehensive list of in-field acquisition equipment, including levels of key equipment redundancy, mechanical and electronic maintenance support available in (or near) field operations.</li> </ul>
2	<ul style="list-style-type: none"> <li>• cursory references to local conditions and imaging challenges without firm proposals how to mitigate</li> <li>• Bidding document contains generic proposals to field parametrisation (source and receiver array configurations, sweep lengths, sweep frequencies, near surface static determination, etc.)</li> <li>• No clear articulation of technical, mechanical or electronic support available to field crew during acquisition operations.</li> </ul>

0	Cursory references to local conditions and challenges without firm proposals how to mitigate Generic list of in-field acquisition equipment, redundancy levels not clarified, mechanical and electronic maintenance support available in (or near) field operations not clarified.
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### 7.3.6 Processing Technology

<b>10%</b>	<b>Processing Technology</b>
<ul style="list-style-type: none"> <li>Proposed processing treatment demonstrates understanding of local imaging challenges</li> </ul>	
Scores of 2 or 4 not provided for in this criterion	
<b>Score</b>	<b>Evaluation targets</b>
5	<ul style="list-style-type: none"> <li>Demonstrate that local imaging challenges and the acoustic nature of the sedimentary sequences of the Karoo basin is understood</li> <li>Bidding document provides comprehensive proposals with relevant processing technology to mitigate imaging challenges of earlier surveys.</li> <li>Flexibility offered in parameter testing and refinement of processing parameters.</li> </ul>
3	<ul style="list-style-type: none"> <li>Bidding document's treatment and proposals to mitigate imaging problems of legacy data are generic in nature.</li> </ul>
1	<ul style="list-style-type: none"> <li>Cursory references to local conditions and challenges without firm proposals how to mitigate</li> </ul>
0	Processing challenges not addressed

### 7.3.7 2D surveys > 1 000km acquired, processed last 5 years

<b>5%</b>	<b>2D surveys &gt; 1 000km acquired, processed last 5 years</b>
<ul style="list-style-type: none"> <li>2D survey experience can be proprietary or speculative.</li> <li>List survey size, operator, region, high level acquisition parameters- cable length, record length, project plan efficiency (actual vs planned)</li> </ul>	
<b>Score</b>	<b>Evaluation targets</b>
5	>=5 surveys with contactable references for 3 surveys
4	>=3 surveys with contactable references for 3 surveys
3	>=5 surveys but less than 3 references provided

2	>=3 surveys but less than 3 references provided
1	<3 surveys
0	No surveys listed

### 7.3.8 Client feedback from references provided

<b>5%</b>	<b>Client feedback from references provided</b>
	<ul style="list-style-type: none"> <li><i>Averaged qualitative rating feedback sourced from references provided</i></li> </ul>
	<i>Scores of 3 not provided for in this criterion</i>
<b>Score</b>	<b>Evaluation targets</b>
5	Exceeded expectations, will use again, will recommend
4	Met Expectations, will use again, will recommend
2	Will use again but with stricter operator oversight
1	Will not use again

### 7.3.9 SHEQ Certification

<b>5%</b>	<b>Up to date SHEQ Certification</b>
	<ul style="list-style-type: none"> <li><i>The company must have a good track record and <b>provide relevant certification.</b> (e.g. ISO 45001, ISO14001, ISO 9001)</i></li> </ul>
	<i>Scores of 1, 2 or 4 not provided for in this criterion</i>
<b>Score</b>	<b>Evaluation targets</b>
5	Demonstrated valid certification
3	Lapsed certification; In process to renew
0	No certification

### 7.3.10 Project Plan

<b>5%</b>	<b>Project Plan</b>
	<ul style="list-style-type: none"> <li>• <i>The Company must demonstrate competency in the planning and solution in delivering the project.</i></li> <li>• <i>The Company must provide a comprehensive project plan outlining the critical milestones and timelines using the survey assumptions in this proposal.</i></li> <li>• <i>The project plan must indicate pre-survey activities – mobilisation and compliance and safety inspections; acquisition operations – static surveys, line operations, logistics, camp moves; processing operations – infield QA processing, PSTM processing as well as the regional interpretation of the newly processed data.</i></li> </ul>
<b>Score</b>	<b>Evaluation targets</b>
5	Comprehensive and complete project plan adequately addressing critical aspects of the scope of work - adequate and experienced team, resulting in quickest turn-around and superior product
4	Comprehensive and complete project plan adequately addressing critical aspects of the scope of work i.e. – timelines, resources, outputs
3	Project plan addressing all critical aspects of the scope of work
2	Generic project plan not addressing critical aspects of the scope of work
0	No project plan submitted