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APPLICATION FOR Seismic Session  
Seismic Survey, Streets End Area, N.T.  
DS4

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U.L. 116.  
FLAMINGO PETROLEUM PTY. LTD.

*Rodinga  
And.*

22nd February, 1963.

The Secretary,  
Department of National Development,  
P. O. Box 378,  
CANBERRA CITY. A.C.T.



Dear Sir,

The Petroleum Search Subsidy Act 1959-61  
Application for Seismic Subsidy  
Seismic Survey, Steele's Gap Area, N.T.

*O.P. 54*

Flamingo Petroleum Pty. Ltd. hereby applies for subsidy under the above Act for a six week's seismic survey to be carried out in the Steele's Gap Area of the Amadeus and/or Great Artesian Basins in the Northern Territory of Australia.

The following information is supplied in accordance with your "Memorandum of Administrative Procedures relating to Geophysical Surveys" as revised in January, 1963.

1. Name of Applicant: Flamingo Petroleum Pty. Ltd.
2. Registered Address: 128 Queen Street, Melbourne.
3. Nominee and Address, nominated by Applicant:

Spencer S. Chambers,  
A.N.Z. Bank Chambers,  
134 Adelaide Street,  
BRISBANE.

Telephone: 2 3915

Telegraphic Address: "Sillerco"

4. Audited Balance Sheet, Certified Statement, etc.:

An audited balance sheet and a statement from the auditors that funds are available for the full performance of the operation will be forwarded under separate cover.

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5. Details of Petroleum Tenement:

Permit to Prospect for Petroleum No. 54 issued pursuant to the "Petroleum (Prospecting and Mining) Ordinance, 1954-1960, of The Northern Territory of Australia, to Flamingo Petroleum Proprietary Limited.

The permit expires on 20th August, 1963.

6. Location and Description of Survey:

A plan showing the location of the survey, proposed traverses, geographical co-ordinates and main topographical features is attached as Appendix A. The survey will be a reflection seismic survey employing continuous profiling techniques and, wherever possible, 1320' intervals between shot points.

The survey will be entirely within the borders of Oil Permit No. 54.

7. Details of Type, Make and Specification of Equipment:

As per Appendix "C".

8. Details of Proposed Operation:

The traverses comprise approximately 75 miles of continuous profiling, 25 of which are on the north side of the Camel Flat Syncline and 50 of which are contained in a regional line from Steele's Gap south to the beginning of the southernmost line shot by Geoseismic (Australia) Limited in 1961. This latter regional line will include reshooting of all of Geoseismic's work along the Steele's Gap - Malcom's Bore trail except the furthest south segment (see Shot Points and Nos. Map, Appendix "E"). It is felt that this is justified since the four northern segments gave no usable results and, also, no appreciable time or costs could be saved by leaving 4 one-mile segments out of a fifty mile long line.

It is anticipated that Namco will be able to solve the drilling problems encountered by Geoseismic (caving sands) by use of a water injection method that stops caving yet uses a conservative amount of water.

The work on the north side of the Camel Flat Syncline (see locality plan, Appendix "A") will be of a detailed nature and will be done first. The crew will then move to the Steele's Gap - Malcom's Bore line and commence shooting while an analysis of the earlier work is being done. If encouraging results are obtained in either the Camel Flat or Steele's Gap areas it is anticipated that the duration of the survey will be extended to include an additional six weeks.

The survey will commence no later than 28th February and should be completed by 31st March.

If no extension is made, the final report will be available by 31st May, 1963.

For further details on survey control, progress reports and final reports, see Appendix "C".

9. Name, Qualifications and Experience of Key Personnel relevant to Survey:
  
10. Contracts:

Attached as Appendix "B" is a geophysical agreement between Flamingo Petroleum Pty. Ltd. and Namco International, Inc.
11. Operator's Vehicles or Equipment:

All vehicles and/or equipment will be furnished by the contractor.
12. Detailed Cost Estimate:

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13. Reasons for Making Survey:

The detailed coverage in the Camel Flat area and regional coverage in the Steele's Gap Area will, in effect, serve separate purposes.

With respect for the operational problems that will be caused by severe topographic relief in the area the detailed traverses have been laid out to investigate a gravity minimum (see Map No. 2, Appendix "D") that appears to occur on the north flank of the Camel Flat Syncline.

Both surface geology and seismic work (cross-section No. 1, Appendix "E") indicates that the synclinal axis should occur several miles farther south and neither show evidence that a basement low should occur this far north. Seismic work shows some indication of wedging between the upper and lower beds at the south end of the detailed traverse layout and it is felt that this, along with the gravity evidence as described above, may be an indication of thickening of the Bitter Springs Formation which exhibits flow structure and thereby of the possibility of a buried structure that does not manifest itself at the surface. The proposed seismic work should suffice to determine whether these possibilities exist and to indicate what additional work should be done in that event.

The Steele's Gap - Malcom's Bore regional traverse will serve to:-

1. Determine the thickness of sediments in that area.
2. Give light on the relationship of the Amadeus Basin to the Artesian Basin, if any, in that area.
3. Investigate the area for prospective oil traps that could later be detailed with further seismic work.

14. Regional Geology:

The permit covers an area where the east end of the Amadeus Basin is joined to the western edge of the Great Artesian Basin. Map No. 1, Appendix "D", is a regional geological map compiled by T. Madden of Mines Administration Pty. Ltd. in 1960 showing outcrops in Oil Permit 54.

In the northwest part of the permit, where outcrop exposures are good, the Cambrian sequence comprises of 1895 feet of Arumbera Greywacke overlain by 2100 feet of Pulya Pulya Sandstone. No Lower Palaeozoic beds higher than the Pulya Pulya Sandstone outcrop in the area and no evidence has been seen to suggest that they are preserved in the southern covered part of the Permit.

The Upper Palaeozoic and Mesozoic section, excluding the Cretaceous, consists essentially of continental or freshwater deposits of no appreciable thickness. The Cretaceous beds, although they are shales of marine origin, form only a thin veneer over the southern part of the Permit, and even on the southern boundary their thickness should not exceed a few hundred feet.

About 50 miles northwest of Permit 54 at Ooraminna the Arumbera Greywacke is underlain by the Pertatataka formation consisting of about 2500' of sandstones, calcarenites, oolitic limestones and shales. Beneath this lies the Areyonga Formation consisting of sandstones, siltstones and conglomerates totalling about 400 feet in thickness. The Bitter Springs lies beneath the Areyonga and is of indefinite thickness. It consists of dolomitic limestone, limestone, shale and anhydrite and is considered to contain good source and reservoir rocks.

Among the Lower Palaeozoic rocks, the Hugh River Shale and Phillipson Limestone have the most effective source and reservoir qualities. The Arumbera Greywacke and Pulya Pulya Sandstones are not considered prospective.

Severe disturbances seem to have affected the north part of the permit and some intense folding has resulted. Pressure forces causing the folding appear to have emanated from the north and folding may be less intense in the southern part of the area where no outcrops exist due to the thick mantle of Aeolian sands.

15. Appreciation of Existing Geophysical Information:

An appreciation of such existing geophysical information on or relating to the area as is needed to establish the objective of the proposed operation is included in section 13, "Reasons for Making Survey".

Existing geophysical reports on the area are:-

- (a) Gravity Surveys in Oil Permits 34 and 42, Northern Territory - by J.E. Burbury - December, 1960.
- (b) Reflection Seismograph Survey, Steele's Gap, Northern Territory - by Geoseismic (Australia) Limited.

Yours faithfully,



by S. S. Chambers

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