



**INVITATION TO TENDER  
FOR  
2D SEISMIC DATA ACQUISITION &  
IN-FIELD PROCESSING SERVICES  
FOR  
THE BLOCK ERGEL XII**

**SMART OIL MONGOLIA LLC.**

**Tender No: MG12-201801**

**Date: Sep 5th , 2018**

## INDEX

INDEX.....	- 1 -
<b>SECTION A - INSTRUCTIONS TO TENDERERS.....</b>	<b>1</b>
1 PREAMBLE.....	1
2 TENDER INSTRUCTIONS.....	1
3 TENDER EXHIBITS.....	4
4 CONDITIONS OF TENDERING.....	4
5 ENQUIRIES BY TENDERERS.....	6
6 RIGHT OF REFUSAL.....	7
7 ACCEPTANCE OF TENDERS.....	7
8 INSURANCE.....	7
9 PROPOSAL VALIDITY.....	8
10 CURRENCY OF TENDER AWARD.....	8
11 VAT/GST/TAXES AND DUTIES.....	8
12 HSE.....	8
13 BID BOND.....	9
14 BANK GUARANTEES.....	9
15 ADDITIONAL REQUIREMENTS AND ADVICES.....	9
<b>SECTION B – TENDER EXHIBITS.....</b>	<b>11</b>
EXHIBIT 1 - SCOPE OF WORK AND SPECIFICATIONS.....	11
EXHIBIT 2 - FORM OF ACKNOWLEDGEMENT.....	57
EXHIBIT 3 - TENDERER COVERING LETTER.....	61
EXHIBIT 4 - SCHEDULE OF RATES.....	63
EXHIBIT 5 - EXCEPTIONS / QUALIFICATIONS.....	68
EXHIBIT 6 - TENDER CATALOGUE.....	69
EXHIBIT 7 - TECHNICAL PROPOSAL FORM.....	72
EXHIBIT 8 - COMMERCIAL PROPOSAL FORM.....	73
EXHIBIT 9 - BIDDER'S EXPERIENCE FORM.....	74
<b>SECTION C – HEALTH, SAFETY &amp; ENVIRONMENT.....</b>	<b>75</b>
1 POLICY ON SAFETY, HEALTH AND ENVIRONMENT.....	75
2 SAFETY MEETINGS AND AUDITS.....	76
3 REPORTING.....	76
4 SAFETY TOOLS AND EQUIPMENT.....	77
5 HOUSEKEEPING.....	77
6 EMERGENCY EQUIPMENT AND PROCEDURES.....	77
7 ACCIDENT REPORTING AND INVESTIGATION.....	77
8 ALCOHOL/ DRUG POLICY.....	78
9 MEDICAL WELFARE.....	79



## **SECTION A - INSTRUCTIONS TO TENDERERS**

### **1 PREAMBLE**

#### **1.1 PROJECT INFORMATION**

**SMART OIL MONGOLIA LLC.** ("**COMPANY**") is the Operator for the exploration Block Ergel XII, Mongolia. The Company is conducting tenders for the provision of **SERVICES** more specifically set out in **SECTION B, EXHIBIT 1** to this Invitation to Tender.

#### **1.2 CONFORMING TENDER**

1.2.1 Acceptance of any Tender shall be subject to the sufficiency and completeness thereof and receipt prior to the Tender closing date.

Any **AGREEMENT** entered into between the **COMPANY** and the successful Tenderer will be based on the Tender Documents.

Any Tender not complying with the requirements of the "Invitation to Tender" documentation may be rejected

1.2.2 Conforming Tenders are invited which provide:

- No price escalation between bid, commitment and delivery on date to be advised by **SMART OIL MONGOLIA LLC.**; and
- The requisite technical standards for all equipment specified.

### **2 TENDER INSTRUCTIONS**

#### **2.1 NOTIFICATION OF INTENT TO TENDER**

Upon receipt of this Invitation to Tender, each Tenderer is required, within five (5) calendar days of the date of Letter of Invitation, to complete a **FORM OF ACKNOWLEDGEMENT & CONFIDENTIALITY UNDERTAKING (SECTION B, EXHIBIT 2)** confirming whether a Tender will be submitted. This document is to be returned to the address indicated in the Letter of Invitation to Tender and marked as indicated for the attention of the appropriate **COMPANY** representative.

**FORM OF ACKNOWLEDGEMENT & CONFIDENTIALITY UNDERTAKING** Should be submitted to the **COMPANY** by E-mail.

#### **2.2 COMPLIANCE REQUIREMENTS**

In preparing tenders, and to qualify as a conforming Tender, a Tenderer must comply with the following:

- (a) All equipment, personnel and services proposed must meet the applicable specifications, in addition to specific requirements of the laws, decrees and other rules and regulations of Mongolia and or the area of operations where the **SERVICES** are to be delivered ("**Applicable Laws**").



## **SMART OIL MONGOLIA LLC.**

*INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES*

- (b) In submitting a tender, the Tenderer warrants that it is familiar with Applicable Laws governing the conduct of business and will ensure that all personnel engaged in the services, if the tender is successful, will be informed of all relevant Applicable Laws and will comply with them.
- (c) Information requested in the Letter of Invitation to Tender and SECTION B is to be submitted in the format shown. Alternative options may be submitted as long as one of the options is in the form as requested in SECTION B.

### **2.3 TENDER CLOSING TIME AND DATE**

The tenderer shall submit the tender on time, and the failure to submit the tender on time is deemed to be deemed to have abandoned this bid.

Closing Time and Date of Tenders: **10:00 am. Nov 7th , 2018.**

Address of Submission of Tenders: Mongolia, Ulaanbaatar City, Khan-Uul district, 15th commission, Gegeenten complex, Fides tower No. 201.

### **2.4 TENDER SUBMISSION DETAILS**

Tenders may be submitted to the COMPANY for this Tender: One (1) original hardcopy, seven (7) copied hardcopy, one (1) flash memory disk and two (2) CDs of the Tender submitted in a sealed package. The Tender should **be written in Mongolian and English.** Electronic documents need to be provided with word and PDF versions.



**SMART OIL MONGOLIA LLC.**

*INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES*

**The package is to be labelled as follows:**

**TECHNICAL PROPOSAL**

**2D SEISMIC DATA ACQUISITION &  
IN-FIELD PROCESSING SERVICES**

**FOR**

**THE BLOCK ERGEL XII**

**TENDER NO: MG12-201801**

Bidder:

Receiving Person: Mr. Hou Bonan

Tel:

Fax:

**COMMERCIAL PROPOSAL**

**2D SEISMIC DATA ACQUISITION &  
IN-FIELD PROCESSING SERVICES**

**FOR**

**THE BLOCK ERGEL XII**

**TENDER NO: MG12-201801**

Bidder:

Receiving Person: Mr. Hou Bonan

Tel:

Fax:



## **2.5 TENDERS RECEIVED AFTER CLOSING**

Any Tenders received after the closing time may be returned unopened and the Company is under no obligation to consider any such Tenders, irrespective of whether the tender is opened or not. However, the Company may, at its absolute discretion, accept late Tenders.

## **2.6 TENDER FORMAT**

The Tender must be structured in clearly identifiable sections, to include the following:

- Tender Cover Letter – in substantially the same form as that set out in **SECTION B, EXHIBIT3**
- Schedule of Prices & Logistic information – in substantially the same form as that set out in **SECTION B, EXHIBIT4**
- Statement of Exceptions/Qualifications to terms and conditions in the General Terms (in substantially the same form as that set out in **SECTION B, EXHIBIT 5**). Exceptions/qualifications must be limited to issues, which would make the Agreement unacceptable to the Tenderer in its present form. The COMPANY may consider any Tender which contains such exceptions as non-conforming. Exceptions/qualifications shall be supported by proposed revised wording that the Tenderer considers appropriate.
- Alternative Proposals will be considered but only if a conforming tender is submitted. A conforming bid must be submitted. However, Tenders may additionally include any alternative bid proposal to providing the service that the TENDERER considers may materially benefit the COMPANY. The alternative proposal and its benefits to the Company must be fully described in a separate attachment.

## **2.7 TENDER DOCUMENTS**

The Tender Documents mean the complete package enclosed herein including the Invitation to Tender Letter, this Invitation to Tender and each Notice to Tenderer issued by the COMPANY pursuant to this Tender.

## **3 TENDER EXHIBITS**

Tender exhibits are found in **SECTION B** for price details/logistic information and technical content and must be completed in full by the TENDERER.

## **4 CONDITIONS OF TENDERING**

- 4.1 Each document comprising the Tender must be completed in full, all blank spaces must be filled in and any inter-lineation, alterations or erasures must be formally explained and initialled.
- 4.2 The Tender Cover Letter must show the full legal name and business address of the TENDERER (which must be the parent company), including street address, if different from mailing address, and must be signed with the signature of a person or persons



authorised to bind the TENDERER. The full company title of such authorised person or persons must be given in the Tender Cover Letter. Each tender must be dated. Each of the tender attachments must be signed and dated by the same authorised person or persons who sign the Tender Cover Letter. The name of each signatory must be typed or otherwise clearly imprinted below each signature. When requested by the COMPANY, satisfactory evidence of the authority of any signatory on behalf of a TENDERER must be furnished.

This tender does not accept joint bidding.

**Each TENDERER must provide:**

- Details of the registered number and place of incorporation of the company that would enter into the Agreement and details of its parent company, that would provide a parent company guarantee if the tender is successful.
- A copy of the financial accounts for the last three years of the company that would enter into the Agreement and the parent company that would provide the parent company guarantee.
- Details of the applicable bank account that invoices will be paid by Company.

4.3 The COMPANY may at any time not less than five (5) calendar days before the stated closing time and date of tenders, amend, delete, add to or vary the tender documents or any part thereof, or amend, delete, add to or vary any part of the scope of work or the services. Such amendments, deletion or variation will be set out in a Notice to Tenderers. Notices to Tenderers will be numbered consecutively and forwarded to each TENDERER. Any resultant change or adjustment to the Tender price or date of completion of the work will be reflected in the Tender attachments. The COMPANY bears no responsibility for any costs, damages or expenses incurred by TENDERER if such information is not received in sufficient time prior to the tender closing date.

4.4 Should the TENDERER find any discrepancy in or omission from the Tender Documents or should the intent or meaning of the Tender Documents appear unclear or ambiguous to the TENDERER, the TENDERER must immediately forward to the COMPANY in the manner described in item 5.0 a tender inquiry requesting correction, clarification, interpretation or qualification before submitting its tender. The TENDERER making such request will be solely responsible for its timely receipt by the COMPANY. All such requests must be received not later than five (5) calendar days prior to the tender closing date. Replies to such enquiries will be provided in the manner described in item 5.0.

4.5 The TENDERER is responsible for fully informing itself of all conditions relating to the Agreement and the provision of the required Services prior to submitting its tender, including site specific information and bottom conditions (where applicable).



- 4.6 A TENDERER may, without prejudice, withdraw its tender by written notice delivered to the COMPANY prior to the tender closing time at the place where the tenders are to be addressed. Negligence or mistake on the part of the TENDERER in preparing its tender will not confer any right of withdrawal after the closing time.
- 4.7 All TENDERER'S costs relating to the preparation, submission and negotiation, including attendance at any meetings in respect of or associated with the tender must be borne by the TENDERER.
- 4.8 The TENDERER must treat the tender documents and all other information made available by the Company as strictly confidential. The TENDERER must not, without the prior written approval of the Company, divulge any information contained in the tender documents (or made available as aforesaid) to any third party. The TENDERER must endeavour to prevent their employees from so divulging the aforesaid information.
- 4.9 The Company reserves the right upon reasonable notice and prior to the selection of any TENDERER and/or the award of any Agreement, to perform an audit as to its correctness of any or all the information provided by the TENDERER by way of its tender submission.
- 4.10 Pending the execution of an Agreement, the successful tender, shall be capable of immediate and unconditional acceptance by the COMPANY. The COMPANY's acceptance and preparation of an Agreement for execution is without prejudice to the COMPANY's right to treat the TENDERER's failure to execute such Agreement as a breach of the Agreement and its consequent rights and remedies at law.
- 4.11 Tenders submitted will be considered final in terms of commercial prices. The COMPANY will not enter into negotiations on price with any TENDERER, contractor or subcontractor, except insofar as any clarification is required, or following a change to the scope of the work or equipment requirements.

## **5 ENQUIRIES BY TENDERERS**

Tender enquiries may only be submitted by the party named in the Letter of Invitation to Tender to the e-mail address indicated on the Letter of Invitation to Tender and marked and indicated for the attention of the appropriate COMPANY representative.

The COMPANY will use its best endeavours to ensure that all reasonable enquiries are answered no later than five (5) calendar days prior to the tender closing date. The COMPANY will not be under any liability to any TENDERER if the COMPANY fails to answer any such enquiry. Answers to any enquiries that, in the COMPANY's sole judgement, are relevant to the quality of the tenders will be forwarded to all TENDERERS, in the form of a Notice to Tenderers as described in item 4.3, without revealing the source of the enquiry. Any resultant change or adjustment to the tender price must be reflected in the tender submission.





Answers to questions which are specifically related to any alternative proposal by any TENDERER will be treated by the COMPANY as confidential and will be given only to the enquiring TENDERER. The Company bears no responsibility for any costs, damages or expenses incurred by TENDERER if such information is not received prior to the tender closing date.

## **6 RIGHT OF REFUSAL**

The COMPANY reserves the right to:

- Reject any or all tenders;
- Accept any tender in whole or in part;
- Cancel or re-issue the request at any time; and
- Revise the terms and conditions of this Tender Document.

The COMPANY will not necessarily accept the lowest priced tender.

## **7 ACCEPTANCE OF TENDERS**

- 7.1 Sealed tenders will not be opened and electronic lodgement will not be downloaded until after the closing time on the closing date. However, no responsibility will attach to the COMPANY or any of its officers, employees or representatives for the premature opening or viewing of a tender. The successful tender will be determined by the COMPANY in its absolute discretion as soon as practicable after the tender closing date, with the successful and unsuccessful TENDERERS notified of such determination by either email or facsimile. The successful tender will be deemed to be accepted when a notice in writing of such acceptance, Letter of Intent, signed for or on behalf of the Company is delivered (fax or e-mail) or posted to the TENDERER who submits the successful tender. In the latter case, the time of posting will be deemed to be the time of acceptance.
- 7.2 The COMPANY reserves the right to reject any or all tenders for any reason whatsoever and to waive any irregularity or non-conformity in any tender without explanation to the TENDERERS.
- 7.3 The COMPANY is not obliged to disclose to any person the reasons why the COMPANY accepted or rejected a particular tender.
- 7.4 The COMPANY is not liable to compensate any TENDERER (whether successful or unsuccessful) for any cost, liability or expense suffered or incurred by the TENDERER in preparing its tender.

## **8 INSURANCE**

- 8.1 The successful TENDERER must, at all times while it is providing the services, maintain in full force and effect at its own expense, insurance as required by the COMPANY. Such insurance shall be obtained from an insurance company or companies organised under the Applicable Laws.



- 8.2 All TENDERERS are required to submit, with its tender, a letter from a reputable insurance broker/insurer acceptable to COMPANY that the insurance coverage required under the Invitation to Tender to be provided by TENDERER, can be made available. TENDERER must prove to the COMPANY's satisfaction that the insurer or broker from whom such letter has been provided has issued policies of insurance similar to those required under the Agreement and is aware that said policies will apply to work performed under the Agreement between the TENDERER and COMPANY.
- 8.3 Costs of all insurance policies to be provided by TENDERER shall be included in the remuneration that TENDERER will receive under the Agreement.
- 8.4 In relation to the types of insurance required under the Agreement, the Tenderer shall provide with its Tender the names and addresses of the insurance companies which TENDERER proposes to use taking into account any applicable requirements of Applicable Laws.

## **9 PROPOSAL VALIDITY**

Tender prices must remain in effect for 120 days from the date of submission.

## **10 CURRENCY OF TENDER AWARD**

All prices and rates shall be quoted both in the currency of expenditure specified in the Letter of Invitation to Tender. In addition, the TENDERER shall confirm in its quotation the following statement:-

*"All prices and rates quoted are firm and fixed (without escalation) for the duration of any Agreement entered into for the purposes of this Tender, except as otherwise mutually agreed. The Company shall not be liable for currency movements subsequent to the Tender's submission."*

## **11 VAT/GST/TAXES AND DUTIES**

TENDERER acknowledges that COMPANY shall be entitled to withhold from payments made to TENDERER any and all TAXES that COMPANY may be required to withhold in accordance with Applicable Laws.

## **12 HSE**

TENDERER is required to review **SECTION C** (HSE) and provide to COMPANY by the Tender closing date all the information and documents required therein.

TENDERER shall demonstrate to COMPANY its compliance with the requirements contained within the HSE schedules to COMPANY's satisfaction. If the TENDERER is unable to comply in full with any particular clause, the TENDERER may request dispensation in writing from the COMPANY, stating reasons for non-compliance and indicating what alternative measures it will put in place. COMPANY shall review such request and may offer dispensation. If not, TENDERER shall comply with COMPANY's requirements.



### **13 BID BOND**

Bidders are required to transfer the bid bond, USD 100,000.00 (or equivalent MNT), to company's bank account as below before the closing time. Company will provide **Bid Bond Receipt** to the bidder who will have submitted the bid bond.

**Bid Bond Receipt** copy should be attached in the COMMERCIAL PROPOSAL. And the bid bond will be released to the unsuccessful bidder(s) after bidding evaluation.

#### **Bank Information:**

Beneficiary Name: Smart Oil Mongolia LLC

Beneficiary Add: Mongolia, Ulaanbaatar, Sukhbaatar District, 3th khoroo, 5th khoroolol,  
Narnii road-55

Beneficiary Bank: Trade and development bank of Mongolia

Bank Add:14210 peace avenue 19,sukhbaatar district,1 st khoroo,Ulaanbaatar,Mongolia

Beneficiary A/C Number: 420003844 (MNT) , 420003845 (USD) , 420003846 (CNY)

Correspondent of Beneficiary bank code: 105100000041

Bank code type: China-CNAPS

Beneficiary Bank's Swift Code: TDBMMNUB

#### **Bid Bond Contacts for Company**

Attention: Mrs. Li Sufang

E-mail: danshui\_1984@163.com

Tel: +86-10-84922368

### **14 BANK GUARANTEES**

Within 30 days since both sides sign the contract, Bid party shall provide a bank guarantee or performance bond of USD 350,000.00 to COMPANY.

14.1 Within the validity period of the contract, the bank guarantee/performance bond shall be valid.

14.2 If the contract performance is wholly or partially extended, the bank guarantee/performance bond provided by Bid party will be correspondingly extended.

14.3 Fee for opening a bank guarantee/performance bond or period extension will be borne by Bid party.

14.4 Once the contract is completed, the bank guarantee/performance bond will be cancelled.

14.5 If Bid party fails to follow contract requirements to fulfil its obligations, the fund in performance bond will be paid to COMPANY for compensating any loss thereof.

### **15 ADDITIONAL REQUIREMENTS AND ADVICES**



**SMART OIL MONGOLIA LLC.**

*INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES*

15.1 Tenderer is required to state the working experience of 2D or 3D seismic exploration experience in the past 5 years with regard to client, survey size, geographic area and so on.

15.2 To increase the possibility of winning, The TENDERER is to advise its best turnaround estimate in the form of a project plan and timeline. The ability to start in October of year 2018 upon immediate completion of seismic services will be advantageous.

15.3 For key personnel, their brief resumes are required to be attached in the tender documents with regard to name, profession, educational background, qualification, working experience and so on.

15.4 All communications/correspondence with regard to bid preparation/clarification and submission of Bid Proposal shall be made to the following address in English and Chinese:

Attention: Mr. Hou Bonan

Tel: +86-10-84922368

Fax: +86-10-84928085

E-mail: hbn@sinogeo.com

## SECTION B – TENDER EXHIBITS

### EXHIBIT 1 - SCOPE OF WORK AND SPECIFICATIONS

The Company is conducting tenders for the design and provision of 2D seismic data acquisition and in-field processing services ("SERVICES") which is more specifically set out as follows:

#### PART I INTRODUCTION

Ergel-XII Block is geographically located in Domogovi Aymag, belongs to Eastern Gobi Basin in the Eastern Gobi Region, within the scope of Sulinhele - Dzamiin-Uud plain area, and 30-40% surface is small hills, among which distribute flat zones. The absolute altitude of regional surface is 1000-2000m and relative altitude 50-250m. The following figure 1 is a diagram of Ergel-XII Block.

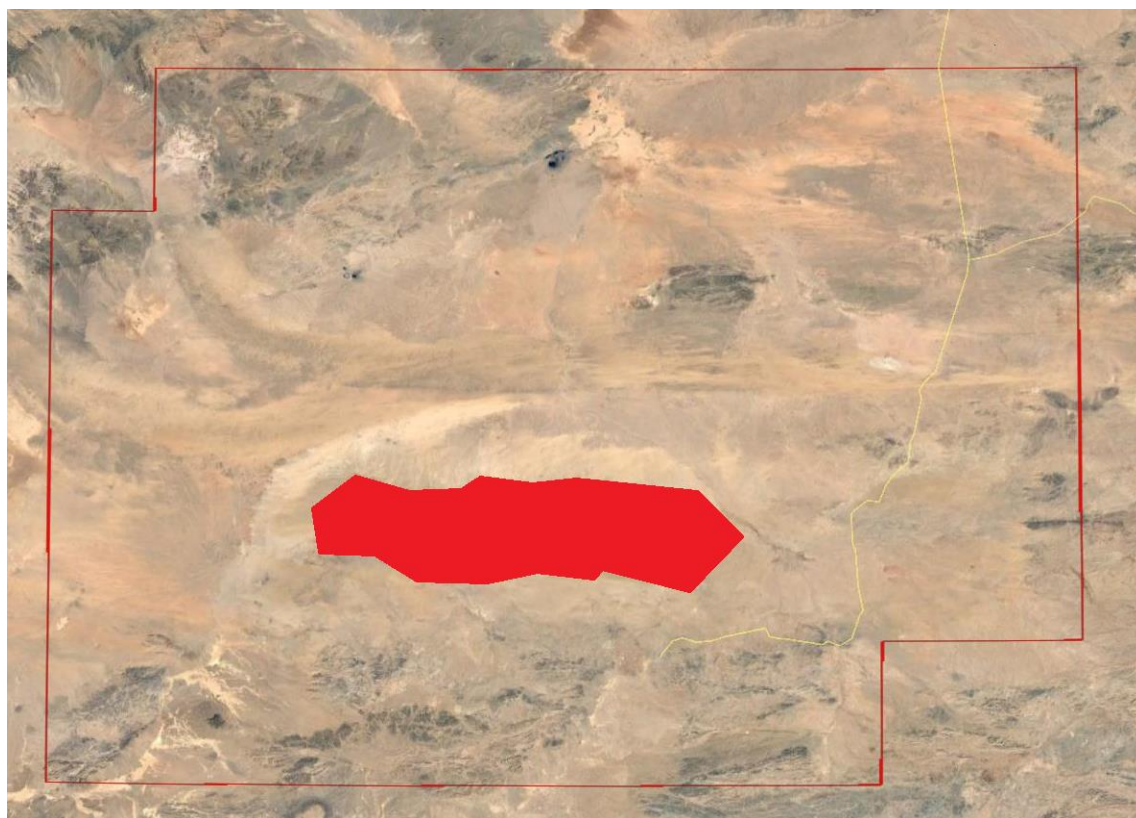


Figure 1 Diagram of Ergel-XII Block

#### BLOCK ERGEL XII inflection point coordinates

	E	N
1	108'09'59'	43'00'00'
2	108'09'59'	43'40'00'
3	108'19'59'	43'40'00'



**SMART OIL MONGOLIA LLC.**

INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES

4	108'19'59'	43'50'00'
5	109'49'00'	43'50'00'
6	109'49'00'	43'10'00'
7	109'29'59'	43'10'00'
8	109'29'59'	43'00'00'

**Coordinates of blocks subtracted from BLOCK ERGEL XII (diagram of red area in the middle)**

	E	N
1	109'12'4	43'20'52
2	109'16'33	43'17'43
3	109'11'25	43'13'58
4	109'3'1	43'15'22
5	109'2'6	43'14'47
6	108'56'58	43'15'6
7	108'51'59	43'14'25
8	108'45'37	43'14'31
9	108'41'6	43'16'22
10	108'36'5	43'16'18
11	108'35'26	43'19'30
12	108'39'21	43'21'55
13	108'44'36	43'20'42
14	108'49'36	43'20'48
15	108'51'12	43'21'50
16	108'56'10	43'21'10
17	109'0'56	43'21'36
18	109'2'57	43'21'28
19	109'12'4	43'20'52

## PART II SCOPE OF WORK

COMPANY will provide 2D seismic acquisition program to CONTRACTOR in the year 2018, 2D seismic survey length was figured out at about 550 kilometres. The schematic diagram of 2D seismic acquisition lines are shown in figure 2

COMPANY shall have the right to change the design according to the actual situation, which will reduce or increase the number or length of the seismic lines.

CONTRACTOR will provide COMPANY with 2D acquisition operation design and furnish the necessary equipment and personnel to carry out the seismic acquisition that including the persons and equipment of the basic crew, materials, tools and supplies, transportation, documentation and shall perform all operations necessary to satisfactorily provide seismic data acquisition services as described herein.

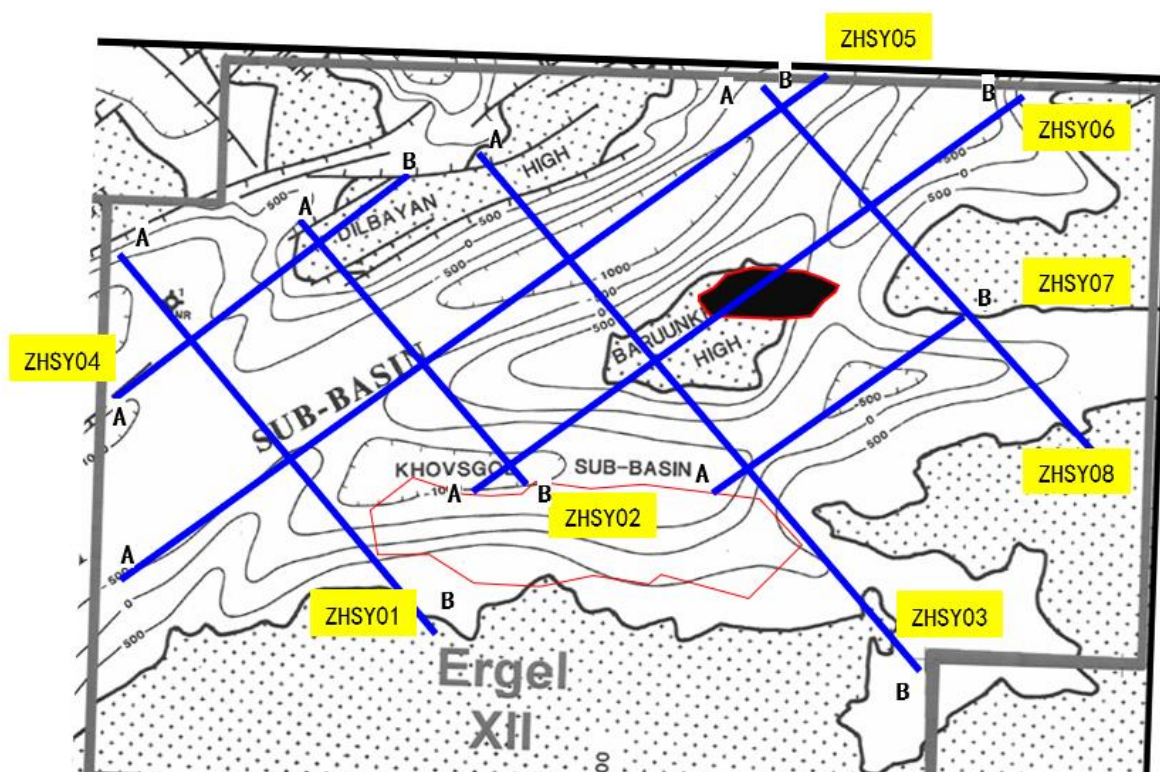


Figure 2 The schematic diagram of 2D seismic acquisition lines

Coordinate table of 2D seismic acquisition lines

No.	Line Number	Endpoint coordinates			Line length (Km)
			E	N	
1	ZHSY001	A	108°11'11.83"	43°36'09.99"	63.23
		B	108°42'21.26"	43°10'41.95"	
2	ZHSY002	A	108°28'14.10"	43°39'13.88"	44.29
		B	108°50'16.01"	43°21'29.91"	
3	ZHSY003	A	108°45'27.40"	43°43'28.15"	88.34
		B	109°29'04.79"	43°07'55.08"	
4	ZHSY004	A	108°11'10.58"	43°26'26.02"	46.95
		B	108°38'12.08"	43°42'26.39"	
5	ZHSY005	A	108°12'18.87"	43°14'02.14"	111.14
		B	109°18'07.18"	43°50'11.42"	
6	ZHSY006	A	108°45'09.30"	43°20'49.21"	86.81
		B	109°36'46.68"	43°48'53.93"	
7	ZHSY007	A	109°08'21.67"	43°21'15.65"	49.50
		B	109°37'57.55"	43°37'03.86"	
8	ZHSY008	A	109°13'55.12"	43°49'45.12"	60.64
		B	109°43'56.61"	43°25'20.15"	
<b>Total</b>	<b>550.9Km</b>				

### 1- SCOUTING OF THE SURVEY AREA

The Company requires that the Contractor is fully aware of all local conditions in relation to seismic operations. Contractor should conduct a detailed scouting trip prior to submission of technical & financial Bid proposal of the Project area to address, amongst others, the following issues:

1. Sufficient base station locations for the survey system, as required.
2. Hazard Maps.
3. Operational Risk Assessment
4. Baseline Environmental assessment of the survey area
5. Evaluate effects and disturbance of the operation on the local habitats.
6. Road Maps and location of airstrips
7. Location of proposed base camp
8. Local logistics and infrastructure.
9. Local legal frame work, in particular for labor and safety regulations.
10. Licensing permits and tax requirements,





## **2- SEISMIC OBJECTIVES**

The aim of the 2D seismic program is to upgrade the existing mapping after 2D seismic acquisition. This seismic reflection survey will help to further delineate the structural configurations and shall be used:

1. To enhance image on reservoir levels for better drilling locations and development of the field.
2. To Identify and map major and minor faults at shallow / deep exploration targets.

To seek reservoir characterization, Reservoir Monitoring.

## **3 SERVICES**

### **3.1 Acquisition Technical Design and Actual Production Plan**

CONTRACTOR shall provide COMPANY with and perform the following services in accordance with the requirement of COMPANY:

Before field operation, CONTRACTOR shall scout the working area and provide COMPANY with 2D acquisition operation program/design. The program shall be subject to seismic acquisition technique design provided by COMPANY and seismic lines operation schedule required by COMPANY and the program shall be approved by COMPANY Representative;

Provides detailed parameters test scheme and actual production plan.

Provides 2D GPS Network Adjustment Report.

Provides security procedure plan .

### **3.2 Work schedule**

The normal workday shall be not less than Ten (10) hours per day, not including travel time. A reduced workday shall apply as required to allow all CONTRACTOR vehicles and personal to return to camp before dark.

Only with HSE department's permission, working time can be extended till later after dark. The normal workweek shall be Seven (7) days per week.

All local legal holidays shall be observed. It is acceptable to COMPANY for the CONTRACTOR to work public holidays providing all relevant Mongolia legislation and laws are being followed.

3.3 CONTRACTOR will mobilize the crew(s) consisting of equipment and personnel as defined in EXHIBIT 1 , so that they are ready and in position in the assigned work site to commence WORK after receipt of the executed CONTRACT, and written notice from COMPANY on the mobilization.



3.4 CONTRACTOR will mobilize to the Work Site an Advance Party, consisting of an Area Manager, Party Chief, Senior Surveyor and Junior Surveyor, The Advance Party should be available at the assigned work site within Twenty Eight (28) days after formal Contract award.

3.5 CONTRACTOR shall arrange and provide at its own expense all applicable personnel, equipment, materials and supplies as described in EXHIBIT 1 herein to satisfy the COMPANY desired high productivity target and safety target.

3.6 Daily production reports showing progress of the seismic crew for each seismic section shall be presented to COMPANY Representative.

3.7 All CONTRACTOR Equipment must be supplied on a “fully operated and maintained” basis by personnel fully trained in the maintenance and use of the equipment.

3.8 CONTRACTOR will hold a weekly safety training & meeting for all workers. Copies of the minutes of meeting shall be presented to COMPANY.

3.9 CONTRACTOR will be responsible for the safe delivery of the original of following items to COMPANY upon completion of each 2D Line and don't allowed any reasons detention. CONTRACTOR shall deliver the original-A first, then deliver the original-B upon the receipt of the original-A portion by COMPANY's E.D. Some deliverables' format may be specified in COMPANY while operation and also don't allowed any reasons detention.

Two (2) Sets of:

- a) Recorded cartridges. (SEG-D format, 3592E)
- b) Seismic acquisition data (SEG-Y format, hard disk)
- c) Auxiliary data (all swath SPS files)
- d) Recording observer's report (Automated).
- e) Seismic line survey report and survey data (in hard copy, SEG-P1 format).
- f) Refraction report (monitor, interpretation plot and interpretation summary)
- g) In-field processing sections (brute stack and PSTM)
- h) Audit reports
- i) Survey Project Report
- j) Parameters experiment analysis report
- k) Monthly reports
- l) Line acceptance log or data delivery list signed by the COMPANY's Representative
- m) Paper Monitors (one set)
- n) Instrument Daily Test Monitor (one set)

Besides, three (3) copies of the following data also should be delivered to COMPANY office:



- a) Project operation design and attached drawing
- b) Summary report of test work, including text, drawings, forms.
- c) Final Summary report of the seismic project
- d) Any other report related to seismic acquisition requested by COMPANY's Representative
- e) Digit disk data with the complete data of all the survey data with SPS format, survey line report, survey project report, test analysis report, daily instrument log, instrument test result, the refraction and up-hole interpretation result, static correction data with SPS format, monthly report, final summary report and any other reports instructed by COMPANY Representative.

1.10 CONTRACTOR will undertake to make use of the hiring of local to perform various duties and other positions that can be filled in support of the operations.

1.11 CONTRACTOR, at its own cost, will ensure that suitable environmental cleanup and restoration is completed during and at project's end in a manner as generally outlined in SECTION C except that restoration shall not include restoration of grass, cut trees, or bridges built with culverts over seasonal rivers.

1.12 CONTRACTOR shall designate personnel to specially be responsible for social relation, damage compensation and security issues. CONTRACTOR shall demonstrate a commitment to good ecological, social and security practices throughout the project. CONTRACTOR will be cognizant and protective of the environment, as well as sensitive to local issues and customs. Offensive behavior by CONTRACTOR Personnel will be considered grounds for dismissal.

1.13 COMPANY under mutual agreement of both parties, may take over operation of the CONTRACTOR Equipment at COMPANY's sole expense if, for any reason, financial or otherwise, CONTRACTOR cannot complete the WORK as described herein.

1.14 CONTRACTOR will ensure that the geophysicist or seismologist provided to support the seismic operations and has sufficient expertise in the use of field processing hardware and software to ensure proper and continued use for data quality control, parameter testing and field processing of all recorded data.

1.15 CONTRACTOR Personnel shall attend a one-day briefing upon arrival at Work Site.

1.16 CONTRACTOR shall be responsible for all medical expenses incurred, during and after the seismic survey. International Emergency Medical Evacuation Insurance/Services (SOS/Compass/or equivalent) must be provided at CONTRACTOR's expense for all CONTRACTOR Personnel working on the project. Documentation proving the existence of this coverage must be provided to COMPANY prior to personnel mobilization from CONTRACTOR's base.

1.17 CONTRACTOR will prepare the organization charts indicating the project reporting structure and relationship of all personnel working on the project and submit to COMPANY Representative for approval prior to commencement of seismic operations.



1.18 The recording parameters will be finalized after initial experimentation and would be subject to changes from time to time during the survey in order to maintain the optimum quality of data acquired as decided by COMPANY's Representative.

1.19 All computer software shall be CONTRACTOR owned as per copyright and software protection laws.

1.20 All personnel, materials, equipment or vehicles supplied by CONTRACTOR shall be under the direct management of CONTRACTOR.

1.21 All local expenses, wages, etc. must be paid on a timely basis. Local banking arrangements should be established at the earliest time possible and adequate money must be transferred to Mongolia so that no delays in payment will occur.

1.22 COMPANY Representative in seismic crew shall be considered at a higher supervisory level to CONTRACTOR Party Chief. All communication from CONTRACTOR shall go through the COMPANY Representative in the crew.

## **2 ADVANCE AND BASIC PARTIES**

**2.1** CONTRACTOR shall detail all personnel, acquisition equipment, vehicles and technology & project support services. It will provide in respect of the Advance Party for scouting, camp construction, establishing survey control points, etc. in the survey area in accordance with COMPANY's requirements in support of the WORK.

**2.2** CONTRACTOR shall submit the detailed plan and schedule for the mobilization of both the Advance and Basic Parties to COMPANY.

**2.3** CONTRACTOR shall provide COMPANY all necessary documents such as program invoice, commercial invoice, packing list and bill of lading (all originals) relating to the importation of equipment and materials to Mongolia for the purpose of expediting the processing of tax exemption and customs clearance.

### **2.4 Advance Party**

The Advance Party's task is to prepare for the arrival of the Basic Party and to commence WORK which may not require the full complement of personnel and equipment contained in the Basic Party. The Advance Party is to arrive at the site Twenty Eight (28) days after the formal Contract Award. Duties of the Advance Party shall include but not be limited to the following:

- a) Conform the base camp location in an area most suitable to all prospect areas as indicated by COMPANY.
- b) Make public relations visit to local government and regulatory officials, coordinated through COMPANY to get relevant permit for entry of the working area, clearance of base camp and lines and employ of local labor and get some other support if necessary.



- c) Scout the working area for making operation plan, clear road and base camp.
- d) Contact local rent COMPANY for proper facilities rent and local manpower company for labor employment, discuss with COMPANY security and local military for arranging security plan and security preparation.
- e) Accurately establish satellite control points and base lines for use in calibrating survey instruments and electronic measuring devices and for line positioning control net.

**2.5 Basic Party**

The Basic Party is to commence WORK when all of the following conditions are fulfilled unless waived in writing by COMPANY:

- a) All personnel listed in the Basic Technical Staff arrived at the Base Camp in Field.
- b) All equipment specified as necessary for the WORK are at the Base Camp and have been inventoried, tested and/or calibrated to the satisfaction of COMPANY, including but not limited to the requirements to geophone testing and so on.
- c) Duties of the Advance Party are performed to COMPANY satisfaction.
- d) Spares and supplies necessary to commence data acquisition are in stock at Base Camp and have been inventoried.
- e) Labor training, safety and operational induction have been implemented.
- f) Accept inspection and audit of COMPANY.
- g) Undertake and perform experimental operation and normal acquisition work as requirement of COMPANY.

**3 DOCUMENTATION AND REPORTING**

No.	Data name	Number of submission		Submission data
		Digitization	Paper	
1.	Project operation design and attached drawing	2	4	15 days before project operation
2.	Parameter test Plan, including text, drawings, forms.	2	2	before parameter test.
3.	Recorded cartridges. (SEG-D format, 3592E)	2	-	After each 2D line is completed.
4.	Seismic acquisition data (SEG-Y format, hard disk)	2	-	After each 2D line is completed.



5.	Auxiliary data (all swath SPS files)	2	-	After each 2D line is completed.
6.	Recording observer's report	2	4	After each 2D line is completed.
7.	Seismic line survey report and survey data (in hard copy, SEG-P1 format).	2	4	After each 2D line is completed.
8.	Refraction report (monitor, interpretation plot and interpretation summary)	2	4	After each 2D line is completed.
9.	In-field processing sections (brute stack and PSTM)	2	-	After each 2D line is completed.
10.	Audit reports	2	4	After crew set up audit is completed.
11.	Line completed Report	2	4	After each 2D line is completed.
12.	Parameters experiment analysis report	2	4	After Parameters test is completed.
13.	Monthly reports	2	4	After each month.
14.	Line acceptance log or data delivery list signed by the COMPANY's Representative	2	1	After each 2D line is completed.
15.	Paper Monitors	2	1	After each 2D line is completed.
16.	Instrument Daily Test Monitor	2	1	After each 2D line is completed.
17.	Final Summary report of the seismic project	2	4	30 days after well completion
18.	Any other report related to seismic acquisition request2d by COMPANY's Representative	2	4	30 days after well completion



19.	Digit disk data with the complete data of all the survey data with SPS format, survey line report, survey project report, test analysis report, daily instrument log, instrument test result, the refraction and up-hole interpretation result, static correction data with SPS format, monthly report, final summary report and any other reports instructed by COMPANY Representative.	2	-	30 days after well completion
-----	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------	---	---	-------------------------------

Data filling requirements:

- 1) CONTRACTOR should submit the documents in accordance with the time-table above, and submit the final reports in 15 days after passing the inspection and acceptance.
- 2) All the data should be submitted in Mongolian, Chinese and English respectively.
- 3) The binding mode of the documents is the adhesive binding with line. COMPANY will provide the data layout form to CONTRACTOR.
- 4) For digitization documents without special instructions, Party B shall submit digital data in the form of mobile hard disk and print the contract name, the block name and the name of two parties.
- 5) The digital documents should be in PDF and editable form.
- 6) All acceptance, periodic, and daily test results and supporting documents become the property of the Buyer. Unless otherwise specified the documents, tapes, and digital media associated with test procedures and tasks must be sent to the Field Supervisor at the address specified in the Order.



**PART III GEODETIC PARAMETERS**

<b>GEODETIC PARAMETERS TO BE USED DURING DATA ACQUISITION</b>	
Positioning Method	RTK
Spheroid	WGS 84
Semi-Major Axis	6378137.0000
Semi-Minor Axis	6356756.3142
Reciprocal of Flattening	298.25722356300
Datum	WGS 84 ellipsoid
Projection	UTM (6°zone)
Central Meridian (CM)	117°E
Reference Latitude	0°
Scale Factor, k	0.9996
False Easting	500000m
False Northing	0m
Projection Units	Zone 50° North
<b>GEODETIC PARAMETERS FOR LOCAL DATUM REPORTING &amp; MAPPING</b>	
Spheroid	Russian
Semi-Major Axis	6378245.000
Semi-minor axis	6356863.019
Reciprocal of Flattening	1/298.3
Datum	WGS 84 and CS 42
Projection	Gauss-Krüger (6°zone)
Central Meridian (CM)	117°E
Reference Latitude	0°
Scale Factor, k	1.0000
False Easting	500000m
False Northing	0m
Projection Units	20°
Shift Parameters WGS-84 to Local Datum WGS-84 Bursa Wolf Convention. Bursa Wolf	To be determined

**PART IV BIDDER 'S PERSONNEL AND FIELD EQUIPMENT**

**1. PERSONNEL**





Following is the list of minimum personnel to be made a part of the agreement for seismic data acquisition, between the Company and Contractor for 2D seismic reflection data acquisition in the Project

1	Party Chief	01
2	Recording Observer ( 05 to 15 years experience )	03
3	QC Geophysicists ( 05 to 15 years experience )	02
4.	On-site seismic data processor( 05 to 15 years experience )	02
5.	HSE Advisor (one for base and one for fly camp)	02
6.	Medical Doctor	02
7.	Accounts / Admin Assistants	02
7	Surveyors	07
8	Radio Operator	02
9	Recording Field Assistant	02
10	Drilling Technicians	00
11	Vibrator Technicians & Shooting Supervisor	03
12	Vibrator Operators	06
13	Plant Attendant / Electrician	02
14	Mechanics	05
15	Carpenter	01
16	Dozer Operators	As required
17	Any other as per requirement (cook & bearer)	

## 2. FIELD EQUIPMENT

Following is the basic field equipment which will be provided by the Contractor to perform the 2D seismic reflection data acquisition job in the Project.



<b>A.</b>	<b>RECORDING EQUIPMENT</b>	
	24 bit latest telemetry system (Like 428 XL&G3i ) or better with details as under.	
	1.	Recording / Instrument Type / Make / Model / Specification / maximum Number of active channels available/ channel capability with Vibroseis / dynamite mode /online data quality control system and Vibroseis QC system
	2.	Detail of Ground Electronics / cables with years of purchase Number of available Geophone strings / (JF-20DX or equivalent / better). Please provide Technical Literature
	3.	12 Nos. of Geophone per string( Configuration, 06 series +06 series & both series in parallel)
	4.	Detail of auxiliary / test equipment for ground electronics and geophone groups
	5.	Encoder / Decoder (Shooting Equipment) Equipped with GPS.
<b>B.</b>	<b>SOURCE EQUIPMENT</b>	
		Vibroseis Mode/Energy source for the area
	1.	Vibrators (At least 05 Nos.), Peak force not less than 60000 lb equipped with DGPS System.
<b>C.</b>	<b>REFRACTION / UPHOLE LOGGING UNITS</b>	
	1.	Up-hole Logging Unit
		24 bit Instrument with Specification, type of geophones & numbers (4.5 HZ)
		Rig with Capacity(100m)
	2.	LVL / Refraction Survey Unit, type of geophones & numbers
		Instrument Specification / Spread Length / Channels
		LVL processing & Statics calculation software
<b>D.</b>	<b>ON-SITE SEISMIC DATA PROCESSING UNIT AND 2D PLANNING AND DESIGNING SOFTWARE</b>	
	1.	Make / Model of Hardware / Plotter
	2.	Detail of 2D Processing Software
<b>E</b>	<b>GPS AND SURVEY EQUIPMENT</b>	
	1.	Make /Model of GPS and other equipment
	2.	Version Number
	3.	Survey Computation Software
<b>F.</b>	Detail of vehicles and other machinery like dozers, tractors and Generators in the crew.	



**SMART OIL MONGOLIA LLC.**

*INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES*

<b>G.</b>	Radio and Communication equipment & facilities
<b>H.</b>	Experience of working
<b>I.</b>	Miscellaneous equipment etc.



**PART V PARAMETERS AND TECHNICAL STANDARDS**

**1. GENERAL WORK STANDARDS**

1.1 PURPOSE: The Work Standards set forth below are intended to provide a reasonable minimum standard of reference for CONTRACTOR work performance. COMPANY rejects any data provided by CONTRACTOR for failure to meet the minimum work standards, CONTRACTOR shall re-record the data in a timely manner at no cost to COMPANY.

1.2 CONTRACTOR'S OWN WORK STANDARDS: In the event CONTRACTOR routinely operates under CONTRACTOR work standards which are more stringent than corresponding items herein, the more stringent standards of CONTRACTOR shall apply subject to review and concurrence of COMPANY Representative.

1.3 MODIFICATION OF SPECIFICATIONS: Any alteration or modification of these specifications shall be done only with the approval of COMPANY's Representative. COMPANY's Representative(s) at the Work Site may waive the requirement to re-record all or part of a particular line or VPs interval if doing so is consistent with the overall objectives of the WORK.

1.4 COMMUNICATION: CONTRACTOR shall maintain continuous, effective two-way communication between their base office and their crew and COMPANY.

1.5 DATA ACQUISITION: At all times while survey is under way, CONTRACTOR's operator shall ensure that all instruments are properly calibrated, equipment operating correctly and that all recorded data are readable, accurate, and properly annotated.

2. While COMPANY will normally specify the main seismic and equipment parameters, CONTRACTOR is encouraged to suggest innovations, which it considers, would result in the improvement of data quality and production. CONTRACTOR shall submit recommendation on the improvements for the COMPANY to approve before applying the changes/innovations.

3. CONTRACTOR will be responsible for the daily monitoring of the recorded data and shall immediately inform COMPANY Representative in seismic crew in writing if the data quality fall below the standards specified in this schedule or if the recorded data are technically impaired in any way.

4. The following standards shall apply to the WORK

**2. 2D Recording Parameter - Production Recording**

The following is subject to changes to accommodate the parameter tests result.

**a) Recording**

a) Instrument	Sercel SN 428 or better
b) Sample rate	1 ms (be confirmed)



**SMART OIL MONGOLIA LLC.**

INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES

c) Record length	6 seconds
d) Low cut filter	Out (or to be confirmed)
e) High cut filter	250Hz (or out to be confirmed)
f) Format	SEG-D
g) Pre-amplifier gain	12 dB (To be confirmed)
h) Recording medium	IBM 3592E cartridge compatible
i) All acquisition & auxiliary equipment	<b>Pass test and have not been repaired</b>

**b) 2D Geometry**

The recommended 2D geometries selectable in this CONTRACT are as following table (Actually the 2D geometry adopted shall conform to that defined or defined in the test approved by COMPANY)

The operational mode on survey margins is roll in and roll out.

Option:	A	B	C	D	E
Full fold coverage	260	200	160	130	100
Geometry (meters)	3892.5-7.5-15-7.5-3892.5	3990-10-20-10-3990	3987.5-12.5-25-12.5-3987.5	3892.5-7.5-15-7.5-3892.5	3990-10-20-10-3990
Number of traces:	520	400	320	520	400
Trace Interval:	15	20	25	15	20
Shot point Interval:	15	20	25	30	40

**c) Geophone array**

- Geophones per station: 24 geophones
- Pattern: in 2 rows (inline direction) and 12 geophones per row, symmetrical on the stake number.
- Pattern length: 11 m
- Inner interval: 2 m
- Geophone model: JF-20DX or equivalent
- Natural frequency: 10Hz
- Out of factory date: No more than three years



CONTRACTOR shall provide minimum 2000 channels 428 cables and 4000 geophone strings, that will adapt to any possible change/improvement of the project.

CONTRACTOR is encouraged to use wireless acquisition, which it considers, would result in the improvement of production.

There will be a sufficient number of Power Units to be deployed on and ahead of the active spread, to be ready for picking-up, to be available for troubleshooting demands, and to be undergoing recharge at the recharge facility.

Equipment not tested in the Acceptance Tests may be used if tested by the comparable Periodic Test sequence. Equipment or electronic instrumentation will not be used for seismic data acquisition unless it has passed an Acceptance Test or a Periodic Test.

**d) Source**

The CONTRACTOR shall perform all operations and discharge all shots/vibrations at a safe distance, and beyond the minimum distances specified by the Government or COMPANY (pursuant to this CONTRACT), whichever specifies maximum distance, from all property owned by third parties, and the CONTRACTOR shall take all reasonable steps to minimize the risk of damage by concussion or otherwise to such property. In the absence of Government prescribed distances, the CONTRACTOR shall operate in accordance with the directions provided by COMPANY.

**e) Vibrator**

a) Type	SERCEL or INOVA Vibrator- within five years
b) Hold down weight	62000 lbs (at least) equivalent
c) Maximum Peak force	60000 lbs (at least)
d) Drive Level	70-75% after test
e) No. of vibrator	5 (4 working, 1 spare)
f) Sweep length	16 s after test
g) Sweep frequency	5- 96 Hz, after test
h) Sweep type	Linear
i) Taper	300 ms after test
j) Vertical Stack	2-4 after test
k) Vibrator distance	12.5 m
l) Vibrator QC	Sercel VE432/464 QC or equivalente
m) Shot position	Array centered between two receiver stations

**f) LVL (Refraction) Survey**

a) Recording	R-24 or equivalent
--------------	--------------------



**SMART OIL MONGOLIA LLC.**

*INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES*

system	
b) Refraction interval	1.5 km average, up to one km for complex area (To be confirmed)
c) Length of spread	120m – 200m (to be confirmed)
d) No of channels	24/48 channels
e) Minimum offset	1-2 m (to be confirmed)
f) Channel interval	1m, 2m, 3m, 5m, 7m, 10m, 10m, 15m, 15m, 20m, 25m, 30m, 25m, 20m, 15m, 15m, 10m, 10m, 7m, 5m, 3m, 2m, 1m respectively (may be changed if not suitable)
g) Recording length	512 ms
h) Sample rate	0.25 ms
i) Source	Weight drop on ground
j) No. of shots	2 shots (one on either side of spread)

The operation method is as design approved by COMPANY.

All the detail parameters shall be decided finally by the test in working site.

**g) In-field processing section**

The In-field processing is the basic processing up to stack for QC in the field operation. COMPANY could add the additional step in special purpose. The Hardware and software should be capable to run such processes as frequency domain analysis, FK, Amplitude spectrum , S/N analysis , Residual static correction and Prestack time migration.

CONTRACTOR shall address briefly the surface condition on the section; analyze and explain the reason while poor data section occurs.



**PART V : EQUIPMENT TESTING BEFORE COMMENCEMENT OF SURVEY**

1. COMPANY will observe the tests laid down hereunder and will inspect CONTRACTOR's equipment at mobilization to ensure all equipment are in good condition and functioning in accordance with the manufacturer's specifications. All tests shall be performed in the presence of and verified by COMPANY Representatives.
2. A full set of manufacturer's specified instrument tests, including but not limited to those specified hereunder shall be performed at the following times:
  - a) Before the commencement of the survey.
  - b) At Thirty (30) days intervals throughout the survey (monthly tests).
  - c) On completion of the operation.
  - d) Following instrument failure and subsequent repairs.
  - e) As reasonably requested by COMPANY's Representative.
3. The full set of manufacturer's specified instrument tests shall include but not be limited to the following, subject to the recording equipment in use:
  - a) Dynamic range determination
  - b) Seismic channel gain accuracy
  - c) Harmonic distortion
  - d) DC Offset
  - e) RMS amplitude analysis
  - f) Pulse test
  - g) Cross feed test
  - h) Polarity test
  - i) Tape speed and read level test if applicable
  - j) Noise Test
  - k) CMRR
  - l) System delay

**“or” Tests as specified in the instrument manufacturer's test procedures.**
4. All data acquisition station units available on the crew shall be tested. Any which fail to meet the manufacturer's specifications shall be withdrawn from use until such time as they have been repaired and satisfactorily re-tested.
5. All vibrators will be thoroughly tested including: start time calibration; tap tests; hard wire similarities using possible production sweep parameters. Mass and baseplate accelerometers shall be used. Full computer analysis (using a COMPANY approved system) including: Phase; Harmonic Distortion; Fundamental Ground Force; shall be documented and copies of this report, which shall include details of ground conditions, will be available on the crew for the duration of the survey.
6. All vibrator electronics, correlators and stackers should be tested. These tests should include but not be limited to the following, subject to the equipment in use:
  - a) Summation of positive and negative sine wave of same frequency (sum-to-zero test).





- b) Summation of positive sine wave of harmonic frequencies.
- c) Examination of pilot/test correlation from correlator.
7. If any of these tests are performed automatically, full details should be supplied to COMPANY's Representative.
8. If the recording crew is equipped with radio line communications, the input noise of the seismic instrument recorded at maximum gain while transmitting should be checked and recorded on the monthly test tape.
9. The polarity of all systems, including vibrators, recording instruments, geophones, tape deck and camera, should be demonstrated to satisfy the 'SEG' normal polarity. This test should be extensively documented. Copies of this report will be sent immediately to COMPANY's Representative, and the COMPANY's data center and a copy shall be available on the crew at all times.
10. As an integral part of the above-mentioned tests, CONTRACTOR shall perform the following tests prior to commencement of recording:
  - a) Geophone leakage test on all strings while immersed in water.
  - b) Geophone conductivity and sensitivity tests using SMT-400 or equivalent.
  - c) Cable continuity and cross feed test on all cables.
11. A hard copy of these test results for each cable and geophone string (marked with a unique number) must be approved by the COMPANY Representative in seismic crew.
12. Cables and geophones should be tested daily in batches such that all of them are tested in rotation at least once every month.
13. Both a hardcopy printout and ASCII file on diskette of all geophone test results from all geophones shall be submitted to COMPANY Representative prior to commencement of recording. All other tests shall be processed on the In-field processing system and similarly submitted to COMPANY Representative prior to commencement of recording.
14. A complete set of manuals; specification sheets and technical drawings shall be made available in the field office for all instruments, cables, boxes, geophone and other major equipment.
15. Contractor shall have in place at the work site a periodic/routine maintenance system and personnel to ensure that all cables, receivers, and connecting wire and plugs are electrically and water-bath tested every 30-45 days unless otherwise agreed upon

## **PART VI : INSTRUMENT/EQUIPMENT TESTS DURING OPERATION**

1. The recommended selection of tests from the manufacturers tests listed above shall be performed and recorded daily throughout the survey including but not limited to:
  - a) Equivalent input noise test
  - b) Ambient line noise (also when ambient noise conditions change)
  - c) DC offset
  - d) CMRR



- e) Internal pulse test
- f) External (geophone) pulse test
- g) The leakage testing results on spread
- h) The resistance testing results on spread
- i) The Geophone tilt testing results on spread
- j) Vibrator radio similarities test (daily) and wire line similarities test(weekly)
- k) Correlator test

**“or” Tests as specified by COMPANY Representative on site**

2. The daily tests should include a procedure for ensuring that all recording parameters are correct. These include, but are not limited to sample rate, filters, pre-amp settings, record length, sweep parameters and pilot sweep routing, correlation and summing parameters and order, noise suppression etc.:
3. A set of all tests with production parameters should be available in the recording truck to the observer and COMPANY Representative at all times.
4. COMPANY Representative shall be promptly informed of any Equipment breakdown or malfunction as well as operational anomalies, situations out of specifications or which may cause a potential problem.
5. COMPANY Representative shall have the right to request any tests at any time when there is reasonable doubt as to the correct functioning of any Equipment.
6. No research, software or hardware modification is permitted after the acceptance phase of instrument testing without the explicit written approval of the Buyer
7. Periodic Test series and audits are intended to demonstrate continuing performance to specifications, and may be required weekly, monthly, or at a time-specified cycle by agreement between Buyer and Contractor at the beginning of the project.



## **PART VII : TECHNICAL SPECIFICATIONS**

### **1. Quality Assurance and Quality Control**

- 1) CONTRACTOR is responsible for ensuring that all equipment is performing to manufacturers' specifications.
- 2) All Equipment shall be demonstrably fully operational before commencement of the WORK and shall be maintained in this condition throughout the WORK.
- 3) CONTRACTOR shall ensure that the technical specifications and quality standards and procedures as detailed in this document are complied with at all times.
- 4) Instrument tests and calibrations shall be in accordance with manufacturers' specifications and/or CONTRACTOR's recommended procedures. In the latter case, CONTRACTOR shall submit its procedures to COMPANY Representative for approval.
- 5) Throughout the survey CONTRACTOR shall operate a quality system which conforms to the requirements of SY/T-5314-2016 or standard specified by COMPANY and shall use the system to ensure that quality standards are maintained throughout the WORK.
- 6) CONTRACTOR shall ensure that all operational logs and reports are written legibly in good English and correctly annotated.
- 7) COMPANY reserves the right to use its own quality control and/or processing systems in addition to any system provided by the CONTRACTOR. The provision of such systems shall not relieve CONTRACTOR of its quality assurance and quality control responsibilities.
- 8) CONTRACTOR shall provide all necessary information and assistance relating to interfacing of quality control systems if requested by COMPANY.

### **2. DEFECTIVE RECORDING CHANNEL AND DEFECTIVE RECORDS**

#### **2.1 A RECORDING CHANNEL WILL BE CONSIDERED DEFECTIVE IF:**

- a) Geophones are not placed and connected in accordance to specification.
- b) Wild, dead, or weak trace.
- c) The recording channel is not operating in accordance with manufacturer's specifications including CMRR.
- d) A trace showing leakage less than 1 megOhm.
- e) A trace whose polarity is reversed or cannot be determined.
- f) A trace showing unacceptable levels of ambient noise.
- g) A trace showing unacceptable levels of preventable noise generated by the seismic crew (6 dB more than adjacent traces).
- h) It is distorted or has a phase/time shift greater than 1 millisecond.

The minimum binning / fold requirements must be met relevant specification in spite of any bad traces.



- All instrument settings, instrument problems, bad traces, missed time breaks, and parity counts are to be logged clearly in the observer's report.
- i) Unless otherwise specified in the Order, receiver group arrays shall be linear or areal arrays centered on the planned receiver group position, parallel to the receiver line, with the
  - j) For geophones, each geophone shall be planted vertically and or covered to minimize
  - k) sensitivity to ambient noise. If the soil conditions or geophone design are not suitable for geophone burial, then each geophone shall be firmly planted vertically with the top at or below ground level, and the geophone cables shall be firmly secured to prevent movement by wind, animals, etc.
  - l) The receiver cables and connections are to be placed flat on the ground surface to minimize sensitivity to ambient noise. (Avoid cables and connections being “hung” or suspended on vegetation or trees near a physical geophone “plant” ).
  - m) In the event that terrain, culture, or other obstacles prevent an array from being laid out to its full length or width, then the array may be shortened symmetrically (inline and/or crossline) about the planned receiver group position to avoid the obstacle.
  - n) All non-standard receiver group arrays and abnormal offsets must be noted in the Observer ‘s Report. The note must include the receiver station number and a description of how the actual array layout differs from the standard array layout.

## **2.2 DEFECTIVE RECORDS**

- a) Recorded data shall be considered defective if any of the following occur (but not limited to following conditions):
  - i) The tape skew standards are not met. At the start of the WORK neither static nor dynamic skew shall exceed 120 percent of the byte period and this shall not exceed 180 percent at any time during the WORK.
  - ii) There are any timing or large time break errors.
  - ii) There is more than two defective recording channels per live line at the start of a day's production or more than 2% of total channels per live line during any day's production.
  - iii) The instrument fails to meet manufacturer's specifications in any way, in particular as evidenced by instrument tests.
  - iv) Recording instrument/vibrator electronics settings have not been verified as within specifications;
  - v) Any Vibrator malfunctions;
  - vi) All recording channels including time break channels are not proven to be in good working order; TB
  - vii) The reference channels are not recorded correctly;
  - viii) Excessive overdrives, i.e. clipping of seismic data traces.
  - ix) More than Four (4) parity errors per live line.



- x) The daily instrument tests and vibrator similarities are not complete and verified as within specifications.
  - xi) The spread of receiver groups recorded differs from the intended spread by more than five percent; The number of receiver groups recorded is fewer than the correct number by more than five percent;
  - xii) For Vibroseis recording, unless otherwise permitted in an Order, any of the following additional criteria define a defective record: The post-sweep attributes have not been recorded on digital media; The required source location GPS Navigation system has failed; The Vibroseis point has not recorded a correlated seismic record with filtered reference;
  - xiii) Subject to the foregoing, all defective seismic records must be reacquired as soon as reasonably possible after the recording defect or source defect is noticed, unless Buyer Representative agrees that some defective records cannot or need not be reacquired. Any remedial action must be accepted by the Buyer Representative.
- b) CONTRACTOR must adhere to good geophysical recording practices and not record data while spread is noisy due to rain, wind, vehicle or personnel movement, generator noise, etc.
  - c) Whenever CONTRACTOR fails to meet standards or conditions of Defective Recording, CONTRACTOR shall for such time be deemed to have failed to meet technical standards.
  - d) Any deviation from the above specifications shall receive prior written approval from the COMPANY Representative.
  - e) No acceptance for misfire/failed VPs (Vibrator malfunctions) in the 2D operation and re-acquiring is a must for any failed VPs. Within 10% of fold reduction in 2D operation, the maximum 3% of defective VPs for anyone line, and the maximum 2% of defective and skipped VPs for whole project could be accepted by COMPANY.

### **3. RECORDING SPECIFICATIONS**

- a) Pre-project, monthly, weekly and daily instrument checks shall be conducted in accordance with manufacturers' specification and accepted standards of the profession. All tests, together with noise strips, will be recorded on magnetic tape. The results of monthly and weekly tests, including field records, shall be provided promptly to COMPANY for analysis and review. The results of daily tests shall be communicated to COMPANY's Representative(s) on the crew. Any component not meeting specification shall be replaced or repaired and then re-tested before survey continuation.
- b) At a minimum, prior to start of production each day, tests shall be run on field-deployed operational central control unit, station units, cables, source equipment, and detectors. Any component, which does not meet specifications, shall be replaced or repaired and re-tested before the start of each day's production.



- c) The source positioning field equipment shall be checked regularly at an interval agreed between COMPANY and CONTRACTOR. Basically, the check consists of comparison of simultaneous, position common (offset corrected) locations taken by various sets of equipment.
- d) Before commencing recording operations, the CONTRACTOR shall check the polarity. This polarity, for velocity detectors is the first arrival of energy or a tap on the underside of a geophone will produce a negative number on tape and a down going deflection on a paper monitor.
- e) Station units (FDU) and cables shall be rotated inspection so that all units are tested on a monthly basis. A logbook documenting the test of each unit and cable shall be kept.
- f) CONTRACTOR shall provide a detailed description of the recording system (in English) with particular reference to dynamic range and system response with low cut production filters out.
- g) A detailed description of the operating parameters encoded in the tape header must be provided at survey commencement, every instrument parameter must be reviewed in accordance with the acquisition parameters contained within this document.
- h) The instrument system must be capable of performing remote instrumentation tests and geophone testing to detect existing weak or dead detectors.
- i) A full line spread noise test shall be performed each day prior to beginning acquisition recording and subsequently before each acquisition line start. Complete noise tests shall be recorded on production tape cartridges and played out as fixed gain monitor records with a suitable calibration reference. The monitor records shall promptly be made available to COMPANY's Representative.
- j) CONTRACTOR shall provide a multi-channel camera or plotter capable of providing field record displays. The camera or plotter must be capable of displaying the seismic signal on all traces either simultaneously or in turn, along with time breaks and other auxiliary information.
- k) When recording Vibroseis data, CONTRACTOR shall produce a monitor record for each shot (or conform to requirement of COMPANY Representative). In cases where more channels are recorded than can be displayed simultaneously, CONTRACTOR shall make monitor records or plots in such a way that all receiver groups are displayed over subsequent shots. For each shot, a full range of offsets on each side of the spread must be displayed.
- l) Data Recording to Magnetic Tape:
  - l-1 Seismic data shall be recorded in SEG-D format on IBM compatible 3591E/3592E magnetic tape.
  - l-2 Correlated summed field data will be recorded to tape. CONTRACTOR recording system or field processing system must be able to facilitate comparisons of field records that have been summed and correlated with a different number of sweeps



- I-3 CONTRACTOR shall record all data onto new (previously unused), high quality certified tape cartridges.
- I-4 All necessary steps shall be taken to maintain parity error-free recording. All parity errors must be logged.
- I-5 At least once weekly (or additionally as requested by COMPANY's Representative), one tape cartridge from those recorded on each transport shall be selected and played back on the other transport (i.e., record on "A" playback, on "B" and vice versa). Playbacks shall be made of records for which monitors had been made during recording. Playbacks shall be filed with their respective monitors. In lieu of this, reading tapes on a separate transport for entry into a processing system is acceptable.
- I-6 High capacity (3590) tape reels may contain data from multiple survey lines. Interrupted portions of a survey line should be recorded on a common cartridge.
- I-7 Final seismic data delivery to COMPANY should be Hard Disk additionally.

#### **4. GEOPHONE AND CABLE SPECIFICATIONS**

- a) Prior to the commencement of the survey and on COMPANY's request CONTRACTOR shall submit to COMPANY the complete manufacturer's specifications describing the geophone and geophone string parameters including the type of geophone, frequency response curves, coil and damping resistor, the dimensions of the geophone string, the geophone sensitivity, total geophone string resistance and marked with a unique number, the type of connector(s) and all data available on the cable in use. Date of manufacture of equipment will also be indicated.
- b) Throughout the field recording operations, CONTRACTOR shall provide regular and thorough geophone and cable checking and a repair program to minimize geophone and cable defects.
- c) All equipment should be checked in rotation at least once per month. A clear and legible logbook of geophone and cable rotations and listing repairs undertaken should be maintained in the recording workshop. The results of these tests, which shall include full immersion leakage test, polarity and distortion tests, shall be made available for inspection by COMPANY's Representative in seismic crew. COMPANY requires rigorous adherence to these specifications before the acceptance of Basic Party.
- d) CONTRACTOR was required to provide the sequence number of Geophone and FDU before their mobilization. Any damaged geophone wires will be replaced, not repaired. All cables and geophone strings should be marked with a visible code to allow easy identification of spread equipment, which has been checked.
- e) Prior to the start of the seismic survey, all the geophone strings and cables shall be numbered and tested. Any geophone not conforming to manufacturer's specifications must be replaced. If required, random strings of geophone will be selected by COMPANY Representative in seismic crew for testing.



- f) All geophone shall be tested upon insertion into the spreads. No geophone, which fails this test, shall be deployed until repaired and subsequently passing this test.
- g) CONTRACTOR shall provide information on the sensitivity of the geophone sensors quoted in appropriate units.
- h) Location of geophones
  - h1) The geophones in each group shall be laid out using the array pattern established by COMPANY.
  - h2) The geophones shall be positioned such that the difference in elevation of the geophones in any single group shall not exceed One (1) meters.
  - h3) CONTRACTOR's field supervisors shall ensure that all geophone plants achieve proper coupling with the ground. Either spike or flat bases may be used, as appropriate for the condition of the ground. Geophones shall be buried to minimize wind noise.
  - h4) All receiver groups shall be fully operational before recording of each day.
  - h5) In the case of 2D recording, receiver stations shall be located with the following hierarchy:
    - If obstacle(s) prevent deployment of the full geophone array, then place receiver point at the planned (pre-plot) location and specify "short array" (first choice) or "podded" (second choice) geophones. Short arrays or podded geophones must be symmetrical about the flag.
    - If receiver point have to be offset for obstacle(s), the moving distance of Offset receiver point at cross-Line shall not more than 5m, otherwise, the offset shall be confirmed by COMPANY's Representative
    - In the event that terrain, culture, or other obstacles prevent an array from being laid out to its full length or width, then the array may be shortened symmetrically (inline and/or crossline) about the planned receiver group position to avoid the obstacle.
    - All non-standard receiver group arrays and abnormal offsets must be noted in the Observer 's Report. The note must include the receiver station number and a description of how the actual array layout differs from the standard array layout.
    - In general, always apply these concepts:
    - Use short arrays or podded geophones to avoid skidding or moving the receiver location.
  - Skid/move receiver points in such a manner as to minimize the distance between the staked and planned location.

## **5. VIBRATORS SPECIFICATIONS**





After servicing (hydraulic, mechanical and electronic) a vibrator being used on the survey, all the parameters will be carefully checked before resuming production.

#### **5A. Operating Specifications**

- (1) CONTRACTOR shall provide to COMPANY a minimum of Four (4) plus One (1) spares fully mechanically, hydraulically and electronically operationally sound vibrators, as specified according to this CONTRACT.
- (2) A complement of One (1) spare units must be maintained on the line to ensure that no reduction in the overall energy source parameters and configuration occur through vibrator breakdown and lack of an operational replacement. COMPANY will not accept any production where CONTRACTOR cannot provide the agreed number of vibrators for normal production. Only in exceptional cases with the written approval COMPANY's Representative can the crew continue production for a limited time with One (1) less vibrator, if data quality permits. The number of sweeps shall be increased accordingly.
- (3) The number of vibrators specified for production data acquisition must be fully operational at the start of each day's production. Thereafter, production may continue for a limited period of 30 minutes, provided that the number of sweeps is increased proportionally. The product of the number of vibrators times the square root of the number of sweeps must be the same as if all vibrators were on line.
- (4) All vibrators provided by CONTRACTOR shall operate with a peak force output of not less than Eighty percent (80%).
- (5) CONTRACTOR shall ensure that maximum required drive levels are used. Excessive drive level settings which may result in pad de-coupling, thus producing distortion and harmonics should be avoided, if ground conditions dictate lower drive level settings CONTRACTOR shall inform COMPANY's Representative whenever drive levels from standard settings should be altered.
- (6) Each vibrator shall be fully equipped with Pelton Vib Pro, Sercel VE-432/464 or similar electronics package with the latest software version releases from the manufacturers.
- (7) CONTRACTOR will ensure that sufficient spare parts are available at all times to maintain a full set of vibrator electronics in all vibrators contracted to COMPANY.
- (8) The main control unit will be installed in the recording truck and will act as the master control unit for the energy source system. Mobile systems shall be installed in each of the vibrator units.
- (9) All ID numbers and control system codes must be documented and presented to COMPANY's Representative at the start of the program.
- (10) Vibrators and electronic systems shall be capable of providing a suite of options including but not limited to non-linear and linear sweeps, up and down sweeps, sweep scaling.
- (11) Constant monitoring in the recording truck for phase, distortion, RMS and maximum amplitude values, amplitude spectrum and other prime sweep attributes within the sweep control unit shall be performed by CONTRACTOR. This shall be shown on a separate monitor and controlled through an independent computer.



- (12) CONTRACTOR shall make available at the completion of each work day, a diskette and supporting hard copy print outs of attributes that CONTRACTOR and COMPANY determines best, to indicate the acceptance of the source performance for that day. After each day's production, the source QA data on diskette and in an acceptable format to COMPANY, and be made available to COMPANY's Representative for analysis.
- (13) COMPANY preferentially requires CONTRACTOR energy source logging system to provide historical end of day hard copy attributes of accelerometer output, phase error, total distortion percentage, fundamental ground force and ground viscosity / stiffness. CONTRACTOR shall regardless provide the necessary hard copy evidence to ensure overall quality assurance guarantees for the source array.
- (14) During production, operations with the source array must be clearly logged and documented by the observer on observer logs. Pertinent information to be reported will be any failures that occur during sweep, failure of units to sweep or for any other reason that the full source system does not meet operational specifications.
- (15) For 2D seismic programs, the energy source array shall be centered at the midpoint between two receiver station stakes. The proposed source array will likely be an in-line type array. Final desired array patterns and dimensions will be determined during start up parameter testing. CONTRACTOR shall make best effort to select the most efficient parameters and to get the confirm from the Representative as to not limit recording productivity. To avoid unnecessary skips, it will be acceptable for the CONTRACTOR to offer reduced arrays in areas of difficult access.
- (16) A valid QC, Pelton or similar COMPANY approved hardware and software package will be made available throughout the conduct of the program by CONTRACTOR, to enable independent detached analysis of vibrators. All vibrator analysis will be performed by CONTRACTOR provided VIB QC software.
- (17) CONTRACTOR shall equip each vibrator with a DGPS system, to monitor positioning of each unit and improve overall survey accuracy. These units shall be operational at all times. In the event of signal blockage preventing downloading of GPS data, a maximum of One (1) hour of data may be acquired prior to cessation of production, in order to rectify the cause of the problem. Within the dense forest area, if practical, GPS mode shall be acceptable.
- (18) CONTRACTOR shall provide all equipment that is required to perform daily, weekly and monthly tests on the vibrators and electronics as specified herein.
- (19) CONTRACTOR will adhere to the following vibrator specifications, unless CONTRACTOR's own specifications are more stringent:
- Sweep will be in a raw mode rather than a filtered mode
  - The use of an Auto Drive level is not acceptable.
    - (A) Start time error: +100 microseconds from the Pilot sweep excluding various delays due to Radio transmission
    - (B) Maximum phase locking:  $\pm 10$  degrees in raw mode over the duration of the sweep not applicable in Kalman filter mode.



**SMART OIL MONGOLIA LLC.**

*INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES*

- (C) Average phase locking:  $\pm 3$  degrees
- (D) Force envelope: 6 dB from end of start taper to start of end taper
- (E) Harmonics: Post correlation harmonic component amplitude less than -40 dB from correlation –wavelet peak.
- (F) Avg. distortion 25%
- (G) Max distortion 50%
- (H) Min. drive level 75% - or as dictated by ground conditions
- (I) Start taper length 300 msec
- (J) End taper length 300 msec

Notwithstanding the above, final vibrator specifications will be determined following discussion and technical audit, when undertaken by COMPANY.

- (20) Real time monitoring of each sweep/VP will be undertaken, to evaluate the reaction of all production vibrators to changing ground conditions, which may be instrumental and the cause of error messages, emanating from the source units. Assessment of each unit, relative to other operational units, will determine the tolerance of COMPANY and COMPANY's Representative acceptance of such error message flagging, drop in drive levels and higher distortion levels.
- (21) If, during the course of the day, a vibrator is identified to have more than two VP stations with "out of specification" flagged or non-flagged errors, then CONTRACTOR shall remove unit from active duty to determine causation and subsequently rectify faults, prior to unit returning back to active duty.
- (22) At all times the observer will closely monitor the performance of each vibrator during production.
- (23) Each vibrator shall be positioned to maintain spacing within 20% of that specified unless contouring or obstacle avoidance procedures are required.
- (24) An interval of 250 msec after the initial sweep taper shall be allowed for the vibrator to come into phase requirements. The instantaneous phase difference after this "grace period" between any vibrator control signal and the pilot sweep shall not exceed 5 degrees. For frequencies of less than 20Hz an instantaneous time error of 1 msec shall be acceptable. Due consideration will be given to the change in terrain, for example, when the vibrator units move from hard packed trails to cross country operations.
- (25) On systems with amplitude control the maximum relative amplitude variation between pilot spectrum and ground force spectrum will not exceed  $\pm$  (plus or minus) 15% over same time window defined above.
- (26) Maximum absolute amplitude difference between ground force spectra from any pair of vibrators located on similar surface terrain will not exceed  $\pm$  (plus or minus) 15% over same time window as defined above.
- (27) After compensation for radio transmission delays and multiplexer delays, maximum time difference between the vibrator reference sweep and the correlation pilot will not exceed manufacturer's specified start time accuracy.



- (28) Harmonic distortion exceeding a threshold of 50% as indicated by vibrator QC system will be reported immediately to COMPANY's Representative.
- (29) Any vibrator operating with consistently higher, (10% plus), distortion than other units on similar ground (indicated through reduced drive/scale factor) will be thoroughly investigated until cause is known.
- (30) Where communication response between the source units and recording truck or vice versa, is affected by geographical, topographical or other forms of interference, which prevents the down loading of vibrator performance data at the end of every source station, CONTRACTOR shall endeavor to rectify communication problems within Fifteen (15) source points. If problem persist, CONTRACTOR shall take whatever necessary action is needed to re-establish communications between source units and the recording truck prior to continuing production. CONTRACTOR must ensure that vibrator performance continues to meet specifications during the time of communication signal loss.
- (31) Vibrators will be maintained to manufacturer's operating specification in particular with regard to items affecting geophysical performance:
- Correct pressure in high and low pressure hydraulic systems. (Pressure gauges for high and low systems should be visible from inside vehicle cab)
  - Hydraulic leaks should be kept to a minimum.
  - Correct pressure in baseplate isolation airbags.
  - Correct pressure in nitrogen bladders.
  - Baseplate lift chains will be maintained at correct tension.
  - No excessive slackness in baseplate tie rods and bushings.
  - Reaction mass centering within  $\pm 1$ cm (in stationary position).
  - No visible cracking or bending of the baseplate or stilt structure.
  - No excessive leakage from mass or lift cylinder seals.
  - If available, baseplate mats will be used on all vibrators for operating on highways or other paved road surfaces.
- (32) Move-up delay times will be set to ensure no late starts during a pattern. In changing terrain delay time will be adjusted as necessary. However, excessive delays will be investigated.
- (33) In the event that all units miss a sweep during the acquisition of any VP point during the course of the Program, then that VP point shall be re-acquired in full.
- (34) All missed sweeps will be, where practical to do so, investigated by the source mechanic or supervisor.
- (35) In the event one vibrator misses 25% or more of the sweeps in a pattern, the VP will be re-swept.
- (36) On occasions where a single sweep has to be missed by a vibrator unit, due to operational reasons, caused by the indigenous presence of local infrastructure, every effort

shall be undertaken by CONTRACTOR to reposition the vibrator, to prevent such a sweep loss. CONTRACTOR shall log occasions when the above has to be implemented.

(37) Servicing and maintenance diaries will be kept for all vibrators. These shall be made available to COMPANY's Representative, as required for inspection and control purposes.

(38) If the recording crew is equipped with radio line communications, the input noise of the seismic instrument recorded at maximum gain while transmitting has to be checked and recorded on the monthly test tape.

(39) CONTRACTOR shall also provide all the necessary cabling, independent base plate and mass accelerometers to perform start up and weekly wire line tests. The provision of analysis software must be a part of the energy source technical support package.

(40) Start-up technical audit and inspection tests shall be conducted at the discretion of COMPANY Representative on all vibrator units.

### **5B) Vibrators Specific Tests**

Before production begins, CONTRACTOR shall provide the procedures for daily and/or monthly tests (manufacturers' and CONTRACTOR standards) specific to this equipment (vibrators, their electronics, the correlator stacker, etc.), as shall as well the equipment used for quality control.

#### **a) Checks prior to survey start**

##### **i) Similarity tests**

- Conformity checks on the polarity of the acquisition chain: reference correlation signal, reference vibrator signal and ground force signal.
- Zero time homogeneity and repeatability tests (recording instrument, encoder and vibrators).
- Sweep acquisition for each vibrator. These signals will be recorded uncorrelated and will be later correlated with the reference sweep. The reference sweep will be the one used for correlation during the entire survey period.
- The correlated signal peaks will be delayed by the time difference between the end of vibration and the end of recording.
- Sweep acquisitions will be performed by cable and by radio. They will be recorded on auxiliary or seismic channels.
- Sweep acquisition of all vibrators operating simultaneously, uncorrelated then correlated, operation repeated to obtain a VP-equivalent stack.
- Uncorrelated and correlated documents will be supplied to PCOSB.

##### **ii) Correlator - Stacker Tests**

- Stacking function tests.



## SMART OIL MONGOLIA LLC.

INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES

- Correlation function tests (polarity, minimum phase or zero phase correlation).
- Calibration before stack checks (TB, synchronisation).
- Stack amplitude variation checks (number of bits, normalisation).
- Gain recovery checks.
- Noise elimination system checks.
- Weighting checks on the noise elimination windows.
- Amplitude variation checks.

### iii) Other tests

- For comparison, the base plate signal and the ground force signal will be used for the correlation.
- Mechanic and hydraulic controls (hoses, tires, air bag, base plate, hydraulic pressure during vibration, etc.) will be made before start of production.

### b). **Daily Operational Tests**

Radio similarities on all functioning units shall be carried out prior to the start of production each day of operations being conducted with the vibrators.

A final set of radio similarities shall be recorded within the last hour of data acquisition production on all operating vibrators.

When a replacement (substitute) vibrator is brought onto line a. radio similarity shall be performed on the vibrator before it starts production.

If work is interrupted for longer than 1 hour, similarity checks shall be run on all operating vibrators.

Any vibrator that fails radio similarities will not be acceptable to COMPANY for use in production. CONTRACTOR shall not be permitted to use any unit until rectification of fault or faults to the satisfaction of COMPANY's representative.

All similarity tests shall be displayed on paper monitors and also stored as a hard copy on diskette, with identifiable labeling for subsequent analysis and evaluation.

### c). **Hardwire Similarities Tests (weekly test)**

Hardwire tests using an appropriate harnessing cable, peripheral equipment and recording system shall be conducted simultaneously on all contracted vibrators at one-week intervals throughout the term of the contract.

When a vibrator has been removed from the line for any major mechanical (pumps, rams, mass, etc.) or electrical (including electronic) component change, a hardwire similarity must be performed, before the unit in question returns to an operationally acceptable status.



COMPANY's Representative may also approve CONTRACTOR to perform radio similarity, as vibrator acceptance, prior to unit being placed in production, under mitigating circumstances.

All hardwire similarities shall be processed on the day of the tests on a ProMax or equivalent field processing system to verify vibrator integrity. All necessary hardcopy displays shall be produced to support confirmation of equipment status.

Any vibrator that fails hardwire similarities will not be acceptable to COMPANY for use in production. CONTRACTOR shall not be permitted to use any unit until rectification of fault or faults to the satisfaction of COMPANY's Representative.

**d). Monthly Tests**

Independent tests using independent accelerometers and an external system such as a Mountain Systems Vibrator QC systems or proprietary equivalent shall be recorded and processed.

The tests carried out at the beginning of the survey will be repeated at the end of the project.

**5C) Source Offsetting Methodology**

Source Points shall be located on the source point flags laid out by the survey crew. All source points offset by more than Five (5) meters from their flagged location shall be resurveyed. All makeup source points shall be surveyed as normal source points. The daily production report shall include the source point numbers of all offset and makeup shots.

Every effort shall be made to make up VP's skipped due to safe distance standards or physical obstruction.

In the case of 2D recording, VP's shall be located with the following hierarchy:

- a) Source locations can be offset from the pre-plotted location up to a radial distance of one of the CDP intervals as long as the actual location is surveyed.
- b) If larger offset are necessary in the direction vertical to the receiver lines, the maximum distance not to exceed half of the nominal source spacing or according to actually condition to determine.
- c) If the previous procedure is not possible, then the sources should be offset to designate locations only with COMPANY's Representative written Approval.

**6. GEODETIC SURVEY SPECIFICATION**

**6.1 Introduction**

The procedures and specifications described in this document are intended to ensure high quality data, by specifying a reasonable minimum standard of performance normally expected from a seismic CONTRACTOR, and shall apply to all techniques and equipment engaged in the WORK. Any failure by CONTRACTOR to implement, achieve or maintain these procedures, specifications or standards will constitute a default under the TERMS & CONDITIONS.



In the event of conflict between CONTRACTOR's Land Data Acquisition Procedures and COMPANY specified procedures, COMPANY procedures will prevail, except where CONTRACTOR's procedures are more stringent and agreed by COMPANY. It is the responsibility of CONTRACTOR to ensure that all procedural issues are fully discussed with COMPANY and understood by contractor prior to commencement of the WORK.

Wherever significant deviations from specified procedures are required the revised procedures and consequences shall be fully discussed with COMPANY.

CONTRACTOR is required to provide information concerning all equipment, hardware, software, configuration, and the spares complement as detailed in various sections of these specifications as part of the tender.

COMPANY shall provide CONTRACTOR with co-ordinates of the survey area in sufficient time for CONTRACTOR to produce a pre-plot map.

The spheroid, datum and map projection and data presentation methods to be used for the WORK shall be confirmed by COMPANY.

CONTRACTOR shall be responsible for producing a pre-plot map, at a scale appropriate for the size of the survey and showing all lines in relation to the survey area prior to mobilization.

Unless specified elsewhere in this document, the spares complement shall be sufficient to maintain and support operations throughout the duration of the Work.

**STANDARD GEODETIC PARAMETERS**

<b>GEODETIC PARAMETERS TO BE USED DURING DATA ACQUISITION</b>	
Positioning Method	RTK
Spheroid	WGS 84
Semi-Major Axis	6378137.0000
Semi-Minor Axis	6356756.3142
Reciprocal of Flattening	298.25722356300
Datum	WGS 84 ellipsoid
Projection	UTM (6°zone)
Central Meridian (CM)	105° E
Reference Latitude	0°
Scale Factor, k	0.9996
False Easting	500000m
False Northing	0m
Projection Units	Zone 18° North
<b>GEODETIC PARAMETERS FOR LOCAL DATUM REPORTING &amp; MAPPING</b>	
Spheroid	Krassovsky
Semi-Major Axis	6378245.000
Semi-minor axis	6356863.019





Reciprocal of Flattening	1/298.3
Datum	WGS 84 and CS 42
Projection	Gauss-Krüger (6°zone)
Central Meridian (CM)	105°E
Reference Latitude	0°
Scale Factor, k	1.0000
False Easting	500000m
False Northing	0m
Projection Units	18°
Shift Parameters WGS-84 to Local Datum WGS-84 Bursa Wolf Convention. Bursa Wolf	To be determined

**6.2 Quality Assurance and Quality Control**

CONTRACTOR is responsible for ensuring that all equipment is performing to manufacturers' specifications.

All Equipment shall be demonstrably fully operational before commencement of the WORK and shall be maintained in this condition throughout the WORK.

CONTRACTOR shall ensure that the technical specifications and quality standards and procedures as detailed in this document are complied with at all times.

Instrument tests and calibrations shall be in accordance with manufacturers' specifications and/or CONTRACTOR's recommended procedures. In the latter case, CONTRACTOR shall submit its procedures to COMPANY for approval.

Throughout the survey CONTRACTOR shall operate a Quality System which conforms to the requirements of SY/T-5314 or standard specified by COMPANY and shall use the system to ensure that quality standards are maintained throughout the WORK.

CONTRACTOR shall ensure that all operational logs and reports are written legibly and correctly annotated in Chinese, Mongolian and English.

COMPANY reserves the right to use its own quality control and/or processing systems in addition to any system provided by the CONTRACTOR. The provision of such systems shall not relieve CONTRACTOR of its quality assurance and quality control responsibilities. CONTRACTOR shall provide all necessary information and assistance relating to interfacing of quality control systems if requested by COMPANY.

CONTRACTOR shall, using good survey practice and high-precision surveying instruments, be responsible for providing proper survey control required to undertake the WORK.

CONTRACTOR is expected to use good judgment in recommending changes to the actual locations of the seismic lines in order to minimize logistics and access problems while



complying as closely as possible to COMPANY's program map. Line location shall be finally determined by COMPANY Representative. Following procedures shall be observed:

### **6.3 Line Clearance, Positioning and Surveying**

#### **6.3.1 Survey Organization and Supervision**

The positioning and survey of all source and receiver positions and all line, access, helipad (if required) and other clearing activities will be under the responsibility of CONTRACTOR. The execution and quality control of these operations is CONTRACTOR's responsibility.

#### **6.3.2 Station Numbering Convention**

For 2D a system of assigning an unique number to every source and receiver point shall be provided by COMPANY.

#### **6.3.3 Surveying Equipment**

- a) All surveying equipment should be in good repair and adjustment. In the case of surveying equipment older than two years, a statement from a manufacturer's authorized service center indicating that the instrument has been fully serviced and calibrated within the last 12 months must be produced at COMPANY's request.
- b) Surveying equipment will normally comprise some or all of the following, according to the methods of survey to be adopted:
- c) GPS Geodetic receivers, Trimble, Ashtec, Leica or Sercel DGPS portable manpack receivers with data logger/controller and pole mounted antenna  
DGPS receivers mounted on vibrator trucks and/or other vehicles with data logger/controller  
Theodolites with mounted EDM & hand held data logger  
Total stations with inbuilt EDM and data logging  
PC's with suitable I/O devices and software  
Hand held GPS receivers  
Compasses, ranging poles, tapes
- d) All theodolites or total stations should be tested for collimation error and vertical circle index error on a weekly basis. Glass circles and reading micrometer should be free of fungus and be easily readable. Digital displays should be complete and fully switchable.
- e) All EDM equipment should be checked monthly against a measured baseline. The azimuth of this baseline should also be known. Any chains, tapes or wires used should be checked weekly against EDM measured distance.
- f) All GPS receiver should be checked before use against each other by setting each one with its own antenna in short baseline array, recording data for up to 30 minutes and processing the results to determine consistency one with another in respect of the taped array layout. GPS measured baselines should agree with taped baselines within 1 cm.
- g) All compasses must be checked for magnetic variation by pointing on predetermined azimuths in all four quadrants. The results shall be presented to COMPANY



Representative prior to being used in the survey. Compasses shall be compared monthly with the measured baseline azimuth.

- h) All checks and maintenance of any survey equipment shall be logged.

#### 6.3.4 Surveying Control

- a) CONTRACTOR shall establish a network of positioning control points for the survey using static Differential GPS methods. The survey origin or datum point for the GPS control network shall be specified by the COMPANY. In the event that no such point or points is conveniently available, CONTRACTOR will be required to establish two points within the survey area by static GPS observations on the points over 36 hours and processing the data in conjunction with data obtained over the Internet from the nearest two or three IS GPS tracking stations.
- b) The proposed locations of the GPS surveying control points shall be approved by the COMPANY and survey observations taken and reduced by CONTRACTOR prior to line surveying operations commencing or, exceptionally, as the surveying of the seismic line network proceeds. The GPS control point sites ultimately chosen and approved shall be in suitably cleared spaces to allow a clear, unobstructed view of the sky for good satellite signal reception. Together the GPS control stations selected should form a well-conditioned network.
- c) These GPS control stations will provide the surveying control in all three dimensions for the entire survey and for subsequent COMPANY operations so all such stations established should be marked by sufficiently stable steel and concrete monuments, the design of which shall be approved by the COMPANY, to allow a life expectancy of at least 10 years. A minimum of 2 witness points shall be established at each station. COMPANY may require CONTRACTOR to provide surveying ties in both horizontal and vertical to any existing survey control for comparison purposes.
- d) All GPS control points will be established by simultaneous static differential GPS observations at either end of each baseline in the network and be post-processed using recognized software. Three dimensional position solutions shall be computed from pairs of matched data sets.
- e) Measured DGPS baselines will be adjusted in a network covering the whole survey area and co-ordinates derived relative to the fundamental datum point within the network.
- f) Each converged DGPS data set shall yield baseline solutions with a standard deviation of less than 0.2 meter (CEO) horizontally and 0.25 meter vertically.
- g) Geoidal elevations shall be computed using the OSU91A geoid model or alternative model mutually agreed upon and geoid heights determined from the surveyed ellipsoidal values.
- h) All positions from the reduced satellite observations shall be reduced for any offset from GPS antenna to marker. However it is preferable that the antenna be always mounted exactly over the station marker.

- i) CONTRACTOR shall submit an interim report covering the GPS control survey work to COMPANY within 15 days of completion of observations. This report should include the following:
- Description of the survey including method, equipment (including receiver models), chronological record of events, existing master station(s) used in the survey, survey history of the master station, survey network observed.
  - Detailed account of the final processing including software package and release used, and final 2D results reduced to the top of the monument in both geographic and UTM grid co-ordinates on the local datum.
  - Confirmation of all geodetic parameters used during processing including a detailed account and worked example of how the transformation to local datum was made.
  - An estimate of accuracy of the derived coordinates in all three dimensions including the method of determining accuracy. A control network diagram with the a posteriori error ellipses should be provided.
  - A detailed station description of each GPS point showing its location and approach diagram, the date established, a monument description, a photograph, the geographic and UTM grid coordinates reduced to top of monument in the local datum, the geodetic parameters, name of local datum, antenna position during observations, survey team and surveyor responsible.

#### 6.3.5 Survey Operations

- a) Before commencing the line survey, suitable GPS base stations shall be identified within, or close to the survey area. All such stations shall be part of a static GPS network, which shall incorporate at least two stations from the master coordinate list.
- b) This control survey shall achieve an internal accuracy of better than 0.2 m horizontally and 0.25m vertically. Sufficient redundancy must be incorporated in the control survey to prove that the accuracy has been achieved. All new control points established must be permanently monument and uniquely numbered.
- c) The supplied datum transformation between WGS-84 and the local datum must be verified if possible. If a datum shift is determined on site, it must be approved by COMPANY Representative.
- d) The survey must close vertically to better 0.2 times the square root of the traverse distance in kilometers, or 1 meter, whichever is less, (conventional surveys using GPS control).
- e) All survey procedures and equipment must conform to at least those approved by COMPANY before the start-up. The FGCC (Federal Geodetic Control Committee) or GSC (Geodetic Survey of Canada) GPS survey standards and specifications are preferred.



**SMART OIL MONGOLIA LLC.**

*INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES*

- f) All line ends and corner points/bending points shall be marked with an easily recoverable permanent marker (e.g. steel bar in concrete), which shall be uniquely numbered.
- g) All seismic lines and topographical features (e.g. rivers, fences, roads, existing wells, existing seismic markers seismic intersections and existing control stations) crossed will be tied and noted on the change notes and survey notes. Even if data collectors are used, this information is still required.
- h) Offsets shall be measured to all skidded or offset stations. These stations shall be summarized in specific skid/offset sheets. They must be confirmed with the drill logs and observer logs before submission. It should be clear whether the offset location was determined by a measure offset from a GPS observed point, or was surveyed by GPS.
- i) No single leg or radial GPS observations are acceptable.  
If source and receiver stations are to be positioned by RTGPS (Real Time Differential) then a detailed description of the equipment, software and how quality control will be achieved, need to be submitted prior to starting the survey to COMPANY. The desired three-dimensional positioning accuracy should be Order C (2-1) with a base error of 2.0 cm and a line-length dependent error of 20ppm/1:50000 based at a 95% confidence level.
- k) L1 GPS receivers are acceptable but dual frequency receivers capable of measuring P(Y)- codes, C/A-codes , L1, L2 carrier and navigation messages are preferred.
- l) A minimum of three GPS receivers with eight or more independent or parallel (non-sequenced) channels, observing simultaneously, will be used for all observation sessions. A minimum of one-hour raw data shall be recorded at each site, this depends on the baseline length.
- m) Real time differential GPS observations shall be conducted with the elevation masks at the base and rover stations set to 10 degrees, the maximum PDOP shall be 5.0 and the measure sync time 1.0 sec.
- n) For real time differential observations, the minimum number of GPS epochs observed shall be 5.
- o) Real time kinematics (RTK) GPS observations shall be conducted with the elevation masks set to 13 degrees, the maximum PDOP shall be 5.0 and the measure sync time 1.0 sec.
- p) For real time kinematics (RTK) observations, the minimum number of GPS epochs observed shall be 5.
- q) No satellites that are deemed unhealthy by the GPS control segment are to be used in navigation, layout or post processing.
- r) If the RTK reference station start up or modify the parameter configurations, before start the new point survey sufficient check points shall be surveyed on the known stations, the discrepancy between twice survey on the check points shall be within 0.2m horizontally and 0.25m vertically.



## SMART OIL MONGOLIA LLC.

INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES

- s) CONTRACTOR shall be responsible for all line clearance and such clearance shall be kept to the absolute minimum required to safely conduct efficient operations.
- T) CONTRACTOR shall bear sole responsibility for any and all costs associated with damage claims arising from any activity of CONTRACTOR including line clearance unless it is both strictly necessary for the performance of the WORK and in accordance with all other terms and conditions of the CONTRACT.
- u) The contractor shall setout source and receiver points such that the difference between real time observed and planned coordinates are less than 1 meter.
- v) Planned locations may have to be moved depending on terrain conditions where the source array could not be laid out for safety reason, obstacle, or elevation difference is exceed one half wavelength of the dominant high frequency energy in the near-surface layer (about 2m).

### 6.3.6 Setting Out Source and Receiver Stations

- a) Source and receiver stations shall be set out and marked such that their surveyed positions are within 1m of their pre-plot positions.
- b) All surveyed stations shall be marked with an unique number so as to be easily recognized and identified (wooden pegs for example) but any metal or plastic used (pin flags for example) shall be removed on completion of the Work.
- c) A sketch map will be generated for the survey area showing details such as:
  - Topographic features;
  - General terrain and vegetation type;
  - Cultivation or crops of any nature;
  - Proximity of buildings and villages;
  - Locations, width and depth of all rivers and streams;
  - Locations of helipads on or near the line, if applicable;
  - Positions and condition of any roads or footpaths crossing the line;
  - Permanent mark locations on the line;
  - Stations at which a full-length source or receiver array will exceed a 2 m elevation change within the array.
- d) In addition a detailed sketch map shall be produced for each source swath showing access routes between individual source points, sequence in which they should be recorded, charge size or drive level restrictions, etc.
- e) A copy will be given to the recording crew and shooters/lead vibrator driver as well as to COMPANY Representative. The originals of these detailed swath sketches shall be submitted to COMPANY at the completion of the survey.

### 6.3.7 Real-time DGPS Positioning



- a) For setting out by GPS Real Time Kinematic (RTK) methods, On The Fly (OTF) wavelength ambiguity resolution will be needed, in turn necessitating continuous VHF or HF radio contact between a GPS reference station and the field observers.
- b) CONTRACTOR shall ensure that the GPS reference station and any required differential correction radio relay stations are chosen such that the mobile GPS units are always able to receive data transmitted from the base station. Mobile station data uncorrected by data transmitted from the base station is not acceptable.
- c) The line station co-ordinates need to be preprogrammed into the data handling unit prior to beginning the day's work and the points set out sequentially along the line as the work proceeds. Positions delivered by the mobile GPS unit should be checked against a GPS control point other than the base station at the start, during, and end of each day's operations. Any discrepancy in excess of 0.5m will require the cause to be identified and any work completed since the last valid check repeated. In addition each mobile GPS unit will re-measure at least 3 points (usually by repeating in the morning the last 3 points of the previous day) and the planimetric and vertical differences between such repeats will be systematically recorded and analyzed as a measure of repeatability. If any of these differences is in excess of 0.5m then reasons should be provided and COMPANY supervisor will decide if the day's positioning data are acceptable.

#### 6.3.8 Surveying Computations

- a) All observations mentioned above shall be computed and both the raw data and results stored on diskette. Recorded raw data from traverse surveying shall be played out in a conventional field book format so that it may be interpreted to identify any errors and omissions. All land survey computations shall be performed using COMPANY approved software on a personal computer in base camp.
- b) All data shall be input to survey computers by means of data loggers used in the field unless otherwise agreed by COMPANY in writing in which case each value shall be verified manually on a hardcopy printout. Regardless of input procedure, all the observations mentioned in paragraph 6.5 herein, must be incorporated in the survey calculations except where the data are known to be in error.
- c) The computed results shall be contained in disk files denoted with a "P" for provisional or "F" for final where the line has been adjusted for acceptable error. Line names within each file shall be identical with both the COMPANY assigned name and that contained in the observer's log sheets.

All data shall be submitted to COMPANY with all co-ordinate and elevation data in meters shown to Two (2) decimal places.

- d) CONTRACTOR shall submit to COMPANY all survey results regardless of their status, on a regular monthly basis. CONTRACTOR shall ensure that provisional survey co-ordinate and elevation data for each line are submitted to COMPANY at the same time as the seismic data along with diagrams of all line intersections

existing at the time. A second set of such data should be kept on site until completion of the project.

- e) All final survey co-ordinate and elevation data shall be submitted no later than Ten (10) days after completion the Work.

#### 6.4) Survey Reporting

- a) CONTRACTOR shall annotate all positional data and hardcopy coordinate listings with the specified geodetic and grid parameters including datum and projection.
- b) CONTRACTOR shall submit copies of land surveying data including but not limited to maps, diskettes and diagrams on a regular monthly basis and on specific request by COMPANY.
- c) CONTRACTOR shall submit to COMPANY within Thirty (30) days of completion of survey a detailed description of all surveying activities. This should form a separate element of the final operations report and should include, but not be limited to:
  - d) Details of all survey equipment used during the survey including make, serial numbers.
  - e) Details of the calibration method and results for each set of survey equipment.
  - f) A general account of how the control and line surveying was performed, both technically and logistically.
  - g) A detailed account of how the control survey was adjusted, how the line surveying was tied to the GPS network and which points were used to control the survey co-ordinates.
  - h) A list of all sun observations taken for azimuth control.
  - i) A listing of all control point stations employed during the survey. This should include station descriptions with survey history, geodetic datum, geographic and UTM co-ordinates, elevations, GPS antenna heights, photographs, access diagram and description and also a statement of their estimated accuracy.
  - j) An appendix containing all the control point station descriptions.
  - k) A list of co-ordinates established by the survey of other significant points such as wells, old survey or permanent markers, oil seeps etc.
  - l) A statement of all geodetic parameters, projections, datum used during the survey including any datum shifts and transformation parameters used to derive the results.
- m) A summary of all completed lines during the survey.
- n) A chronological log of the main surveying and positioning activities.
- o) Names of key survey staff involved in the WORK.
- p) A discussion of any problems encountered during the survey including periods of instability, equipment failure, poor coverage, or malfunction for other reasons, re-shoots, mis-ties in the land survey, re-surveys, recommendations for future surveys etc.





- q) A final SEG-P1 formatted digital file of the seismic lines surveyed on a predetermined media,
- r) A final detailed survey report, (Five (5) paper copies and on a COMPANY approved digital format),
- s) Program map, (paper copies and on a COMPANY approved digital format,)
- t) Original GPS log sheets, survey notes or any other reports that describe, for example, corrections to antenna heights, processing summaries, problems that occurred during survey,
- u) Description of the control survey to establish the GPS base stations coordinates, including control points used, map of the control network, network data and adjustment results. Specific attention should be paid to describing the definition of the height datum, including the geoid model and values used,
- v) Minimally and fully constrained adjustments (paper and digital outputs),
- w) Skid and offset reports, geodetic datum and projection information, and
- x) Horizontal geodetic datum, transformation parameters and how they were determined, vertical datum, geoid model and projection information, and survey sketch's including for all line surveys:
  - (1) GPS base station,
  - (2) Check points used and ties to them,
  - (3) Vertical and horizontal mistie values for GPS traversing if performed,
  - (4) GPS receiver recording parameters,
  - (5) GPS processing parameters,
  - (6) Datum in which the survey was performed,
  - (7) When any datum shift was applied in the survey process, if applicable,
  - (8) Fly lines and loop ties,
  - (9) Quality control reports (e.g. pre-plot versus post plot).

#### 6.5 Maps

- a) CONTRACTOR shall submit to COMPANY the following maps plotted on within 15 days of the completion of survey:
  - b) Final post-plot shot point and receiver point location maps at 1:25,000 scale showing VP/SP plotted at intervals of 10 and annotated at every 50 as well as the first and last SP/VP of each line.
  - c) A survey marker location map at 1:25,000 scale showing all new control points and permanent markers established during the survey, all found and resurveyed old survey markers, and all reference and relay stations used for DGPS surveying operations.
  - d) An integrated horizontal and vertical closure map at 1:25,000 scale showing the coordinate and elevation differences, the direction of the difference and the traverse distance of each traverse segment. Each traverse shall include the calculated

horizontal accuracy expressed as a ratio. This map should be updated daily and be available for inspection by COMPANY Representative on request.

- e) CONTRACTOR shall maintain an up to date logistics map at all times during the survey.
- f) All maps produced shall show the following:
- Both the UTM and geographic graticule.
  - Shot points at specified frequencies.
  - Line numbers clearly marked on each map.
  - A title block showing the name of COMPANY, name of CONTRACTOR, the name of the block, the actual map title, the date of the WORK and the date of the drawing.
  - A map scale ratio and bar scale in kilometers.
  - The type of grid projection, ellipsoid parameters, and geodetic and vertical datum.
  - A statement of whether the map is final or provisional.
  - An index sketch showing the survey area in relation to national boundaries, the topography and adjacent blocks.
  - All of the above maps shall be kept updated on a daily basis. CONTRACTOR shall submit hard copies of the above maps to COMPANY at any time during the WORK on request.

#### 6.6 RTDGPS Survey of Vibrator Positions

GPS receivers shall be used to record the actual positions and monitor the vibrator positions on each source swath. The antenna must be set at the highest part of and in the same position on the center line of each vehicle, preferably above the vibrator pad, though if this is not possible the offset from the antenna to this point shall be recorded.

The conditions pertaining to radio communication of GPS corrections from reference station to the receiving antenna on the truck shall apply.

A mean real time GPS position from the individual vibrators' positions shall be recorded at each vibrator point and all such data archived at the end of each day's operations as the final VP co-ordinates.



## EXHIBIT 2 - FORM OF ACKNOWLEDGEMENT

### FORM OF ACKNOWLEDGEMENT

Dear Sirs,

Invitation to Tender for the provision of 2D Seismic Data Acquisition & In-Field Processing Services.

#### INVITATION TO TENDER REF:

1. We hereby acknowledge receipt of one set of the above Invitation to Tender Documents.

We confirm our intention of submitting a competitive Tender on or before the time and date set in the letter of Invitation to Tender.

or

We shall not be submitting a Tender on this occasion and we return with this acknowledgement all documentation received in connection with this Invitation to Tender.

2. All communications regarding this Invitation to Tender should be sent to:

*(contact's name, address, telephone, fax number and E-mail address)*

who is responsible for the preparation of our Tender.

*We acknowledge that all information contained in the Invitation to Tender is strictly confidential and we represent, covenant and undertake:*

- to treat all material information related to the Tender as strictly confidential and to take all reasonable and practicable steps to ensure and protect the confidentiality thereof, and not to disclose the existence or content thereof (whether in full or in part or in extract or summary form) to any person not directly dealing with the Tender or any of TENDERER'S employees or consultants that are not directly involved in the preparation of our Tender unless we obtain COMPANY's prior written approval. If such approval is given then, we shall ensure that appropriate confidentiality undertakings are in place (in terms similar to these terms) with each person to whom we discloses material.
- not to exploit any material information supplied by COMPANY;
- not to pay any commission, fees or grant any rebates to any employees, secondees, consultants or officers of COMPANY;
- not to enter into any business arrangements with employees, secondees, consultants or officers of COMPANY likely to result in conflicts of interest between their private financial activities and their part in the conduct of COMPANY business;



**SMART OIL MONGOLIA LLC.**

INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES

- not to favour any employees, secondees, consultants or officers of COMPANY with gifts, transportation, entertainment or any other non-monetary favours or gratuities that are of more than nominal value or that might be construed to exceed customary courtesies extended in accordance with accepted ethical business standards.

Furthermore we have checked the contents of the Invitation to Tender package and have found [them to be complete, legible and in good condition] *(alternatively)* [the following sections are missing/illegible/etc.].

Yours faithfully,

Signature .....

Name .....

Title .....

Date .....



### **CONFIDENTIALITY UNDERTAKING**

We confirm our understanding that it is a condition of the disclosure by **SMART OIL MONGOLIA LLC.** ("**COMPANY**") of Confidential Information to enable us to tender for the Company in relation to this Invitation to Tender Ref. No. \_\_\_\_\_, that we maintain the confidentiality of such Confidential Information in accordance with the terms of this Confidentiality Undertaking.

1. As used in this Undertaking, the term "Confidential Information" shall mean any information in any form received by us which emanates directly or indirectly from the Company which information is not publicly known, including any compilation of otherwise public information in the form not publicly known.
2. It is understood that the term "Confidential Information" does not include
  - (A) information which, after disclosure, has become publicly known, other than as a result of any breach of this Undertaking;
  - (b) information known to us prior to its disclosure by the Company; and
  - (c) information available or obtained from a third party not under an obligation of confidentiality to Company
3. We acknowledge that the Company has a proprietary or other similar interest in maintaining the confidentiality of the Confidential Information and, in consideration of the disclosure by Company to us of the Confidential Information, we agree that we will not disclose or use the Confidential Information for any purpose whatsoever, except only for the purpose of responding to this Invitation to Tender and then only in such manner as to protect fully the confidentiality of such Confidential Information.
4. 1 We further agree:
  - (a) to limit the disclosure of the Confidential Information to those of our officers and employees to whom such disclosure is necessary for the preparation of our response to the Invitation to Tender;
  - (b) to ensure that such officers and employees are bound by equivalent obligations in respect of the Confidential Information to those set out in this Undertaking; and
  - (c) to ensure that they abide by such obligations which we shall enforce diligently.
  - (d) In the event that we employ any agent, contractor or subcontractor we may disclose Confidential Information to such entity if such disclosure is necessary to prepare our response to the Invitation to Tender and we will obtain from such agent, contractor or subcontractor a Confidentiality Undertaking in the same form as that set out herein and produce the same to the Company immediately on request.

We are liable for and hereby indemnify the Company against all claims, losses, damages and expenses (including legal expenses) suffered or incurred by the Company as a result of or in connection with any breach by us of this Undertaking.



5. Upon completion of the preparation of our response to this Invitation to Tender, we shall immediately return any and all materials which contain any Confidential Information including (but not limited to) all documents, plans, samples, drawings, specifications, notebooks, computer software and any other materials whatsoever and all copies made of them.
6. If we develop a product or a process which might have involved the use of any of the Confidential Information we shall forthwith notify the Company of such development and shall upon the request of the Company, supply such information as the Company may require to establish whether the Confidential Information has been so used. Any such product or process shall belong to the Company and we shall do all acts necessary to ensure that title to such product or process passes to the Company at our cost.
7. This Confidentiality Undertaking shall remain in force for five (5) years from the date of signature hereof. This Confidentiality Undertaking shall be governed by and construed in accordance with the laws of England.
8. We acknowledge that any breach of the obligation of confidence contained in this Undertaking will result in unquantifiable loss to the Company and therefore, in the event of any such breach, will submit to an interlocutory injunction or give undertakings to the Court to prevent further breaches, without prejudice to the Company's rights to pursue other forms of relief.

For and behalf of [XXXX]

Signature

.....

Name

.....

Title

.....

Date

.....



### **EXHIBIT 3 - TENDERER COVERING LETTER**

Gentlemen,

**RE: INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES**

We the undersigned tenderer ("**CONTRACTOR**") having read and examined SMART OIL MONGOLIA LLC. ("**COMPANY**") Invitation to Tender Document hereby confirms our full compliance with the specifications enclosed with the Invitation to Tender and proposes to perform the work and provide the services at the rates set forth in the tender submission and in accordance with the terms of the Pro-forma Agreement. Capitalised words in this Form of Tender shall have the meaning set out against them in the Pro-forma Agreement

In case of Agreement award for the work and services, we will submit all the insurances and the guarantees required in the Invitation to Tender Documents.

We certify that we have examined and are fully familiar with all the Invitation to Tender Documents, and that we have carefully reviewed the accuracy of all statements in this tender and attachments hereto and by consideration of the site conditions, satisfied ourselves as to the nature and location of the site, the work and the services and all other matters which can in any way affect the Agreement or the cost thereof.

We understand that the Invitation to Tender is not an offer capable of acceptance by Contractor. Our tender is an offer capable of acceptance by Company on the terms and conditions referred to. We acknowledge that Company is not bound to accept the lowest or any tender that Company may receive.

This Tender shall remain open for acceptance for a period of ninety (90) calendar days from the date fixed for receiving tenders.

We undertake and it shall be a condition precedent to the Company entering into any Agreement made pursuant to this tender that:

- i) this is a bona fide tender intended to be competitive and that we have not fixed or adjusted the amount of the Tender by, or under, or in accordance with any agreement or arrangement with any other person.
  
- ii) any sub-contract by us shall be let by means of a competitive tender wherever possible and that an undertaking and condition to this identical effect shall be included in each sub-contract.
  
- iii) no variations in or acceptance of any Invitation to Tender or tender shall be binding unless agreed in writing by the Company.

We also confirm that we have incorporated into our tender the impact of all taxes.



**SMART OIL MONGOLIA LLC.**

*INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES*

We agree to bear all costs incurred by us in connection with the preparation and submission of this Tender whether or not successful and to bear any further costs incurred by us prior to any award irrespective of whether such award to ourselves or a third party or in the event no award is made. COMPANY reserves the right to perform an audit as to its correctness of any or all the information provided by the tenderer by way of its tender submission prior to a contract award.

Yours faithfully,

Signature .....

Name .....

Title .....

Date .....





## **EXHIBIT 4 - SCHEDULE OF RATES**

### **1. GENERAL**

All rates should be quoted on a production basis of 2D seismic data and infield processing through a sequence which includes Post Stack time migration. The turnkey rate for seismic data acquisition should be quoted for the 2D seismic program. Provisions for weather downtime, lump sum mobilization and lump sum demobilization should also be included. Additionally a rate quoted on an hourly basis should be provided and will apply during testing or when Contractor is unable to work due to circumstances under the Company's control. Only one rate can be charged for any specific period of time or specific data acquisition and in-field processing.

All fees quoted in Exhibit F are inclusive of all required taxes, duties, levies and permitting etc.

### **2. FEES**

#### **2.1 Definitions**

##### **2.1.1 Invoice-able Coverage**

Invoice-able coverage is defined as per recorded and accepted SP/VP (source points, 2D surface coverage= Total number of source points source density per Km) coverage for 2D seismic acquisition and in-field processing through a sequence which includes Post Stack time migration.

##### **2.1.2 Reimbursable Items and Rates**

- Company's supplies and reimbursable items.
- Obligations and expenses for contractor's account.

##### **2.1.3 Currency for Quotation**

All prices shall be firm and definitive for the duration of the contract, prices should be quoted in US Dollars and would be payable in 100% Mongolian Tugrik (MNT) at the inter-bank rate on the date of payment. All payments shall be due and made net sixty (60) days from the date of receipt of the Contractor's invoice.

#### **2.2 Mobilization / Demobilization Fee**

To cover expenses arising from the mobilization for the field unit being supplied by the Contractor to the survey area.

The Mobilization / Demobilization fee will be paid upon completion of setting up the Crew and after the first acceptable recorded production data record.

#### **2.3 Turnkey Rates**

The following turnkey rates are to reimburse CONTRACTOR for all costs related to the use of CONTRACTOR Personnel and equipment including but not limited to all costs related to the repair, maintenance, operation, transportation, duties and individual income taxes associated with such use.



**A. Turnkey Rate for Acquisition of the 2D Program**

For each record of 2D seismic data acquired by CONTRACTOR and accepted by COMPANY, COMPANY shall pay CONTRACTOR as follows:

Acquisition parameters	Option A (USD/Km)	Option B (USD/ Km)	Option C (USD/ Km)	Option D (USD/ Km)	Option E (USD/ Km)
Folds	260	200	160	130	100
Geometry (m)	3892.5-7.5- 15-7.5- 3892.5	3990-10- 20-10-3990	3987.5-12.5- 25-12.5- 3987.5	3892.5- 7.5-15-7.5- 3892.5	3990-10- 20-10-3990
Number of traces	520	400	320	520	400
Trace Interval (m)	15	20	25	15	20
Shot point Interval (m)	15	20	25	30	40
Vibrator Parameter	16s,2V, 1Sweep				
	16s, 2V, 2Sweeps				
	16s, 2V, 3Sweeps				
	16s, 2V, 4Sweeps				
	16s,4V, 1Sweep				
	16s,4V, 2Sweeps				
	16s,4V, 3Sweeps				
	16s,4V, 4Sweeps				

Note:

- a) The above turnkey rates are applied to the 2D seismic acquisition.
- b) The chargeable amount of records shall be calculated based on qualified and accepted records and the chargeable line length or area shall be calculated based on that of source points covered.
- c) If the parameters adopted in production and approved by COMPANY are not mentioned herein, the CONTRACT Amendment to define the corresponding unit price will be made after mutual negotiation. The unit price for CONTRACT Amendment can



**SMART OIL MONGOLIA LLC.**

INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES

be supplemented with reasonable linear interpolation method.

- d) The unit price will not change while the number of active channels vary or the vibrating time (scan time length) is changed during the operation.
- e) COMPANY will not pay for overlap on seismic lines acquired at different time by CONTRACTOR due to wet ground conditions or unsatisfied data quality.

**B. Other charges**

PAYMENT ITEMS		Rates	Amount in US Dollars
<b>DAY RATES / HOURLY RATES</b>			2D
1.1	Day rate (12 hours per day)/hour rate)		
a.	Field experimentation for selection of acquisition parameters (about 3 days for 2D seismic data experimentation)		
b.	Hourly rates shall be applicable during testing at company's request provided that this test program is not covered by turnkey rate.		
1.	<b>Standby Rate</b> (Maximum 2 days) CONTRACTOR shall be paid daily standby rate for each day when the Contractor's crew is ready and available to perform services, but is prevented from doing so due to.		
	a. Force Majeure.		
	b. No daily (full day) production due to weather or safety reasons.		
	c. When the contractor is unable to move between the base camp / fly camp and the work site due to law and order situation, or if the movement of the contractor's personnel and equipment is prevented in the program area but not relating to land permitting. The standby Rate shall not be applicable prior to commencement of recording on the 2D seismic program lines. The Standby Rate shall not apply during any period of time when delay is caused by something for which Contractor is responsible.		
	d. No standby will be applicable against Gazetted / Public Holidays when crew is not working.		
2.	<b>REFRACTION ( LVL ) RECORDING</b> Note: Rates per point should be quoted and to be used for financial evaluation purpose for additional LVL points)		



	<p><b>PAYMENT ITEMS</b></p> <p style="text-align: right;"><b>Rates</b></p>	<p><b>Amount in US Dollars</b></p>
<p><b>3.</b></p>	<p><b><u>UPHOLE LOGGING UPTO 100 M DEPTH</u></b></p> <p>Up-hole depth will be determined after experimentation. Charges per meter should be quoted for additional upholes.</p>	
<p><b>4</b></p>	<p><b><u>LAND / CROP COMPENSATION RATES</u></b></p> <p>The Contractor will be responsible for obtaining all permits from and owners prior to start of surveying for Seismic Data Acquisition program areas and pay all cost incurred for permitting, land surface and subsurface (shot holes) damage caused by Seismic Data Acquisition and negligent damage caused by Contractor.</p>	
<p><b>5</b></p>	<p><b><u>SECURITY CHARGES</u></b></p> <p>Contractor shall be fully responsible for arrangement of security. Contractor will be also responsible for transport, accommodation and food for the security agencies that will provide security cover to the Contractor's Crew/ employees, company Representative, all crew's equipment and consumables. Company will advise on security matters required at the request of the Contractor.</p> <p><b>Quoted turnkey rates per L. km should include the security charges and must be mentioned in the submitted financial bid.</b></p>	
<p><b>6</b></p>	<p><b><u>GENERAL SERVICES CONDITIONS</u></b></p> <p>Services and Items to be supplied by CONTRACTOR but not limited to:</p> <ul style="list-style-type: none"> <li>a. Salaries, wages, travel social insurance, food and lodging and all other personnel costs for Contractor's personnel listed in the chapter PERSONNEL.</li> <li>b. Local labor and associated cost (transport, taxes, workman's compensation etc).</li> <li>c. All fuels and lubricants, including transport fees.</li> <li>d. Insurance for personnel and equipment.</li> <li>e. All consumables including recording tapes/ cartridges.</li> <li>f. Food, boarding &amp; lodging, and office facilities for four of Company's personnel and Two (4 x 4) vehicles for company representatives.</li> <li>g. Spare and repair parts and maintenance of equipment listed in the Chapter of Equipment.</li> <li>h. All permits and authorizations for the execution of the services</li> </ul>	



**SMART OIL MONGOLIA LLC.**

*INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES*

<b>PAYMENT ITEMS</b>	<b>Rates</b>	<b>Amount in US Dollars</b>
	including land entry permits. If the Contractor is responsible for delay in progress of the Work(s), it shall use such additional equipment and or personnel as may be necessary to eliminate delay in completion of the work on the dates specified by the Company at no additional cost. NOTE: Evaluation shall be carried out on complete package basis.	



**EXHIBIT 5 - EXCEPTIONS / QUALIFICATIONS**

<b>ITEM / CLAUSE NO.</b>	<b>TENDERER QUALIFICATION</b>	<b>TENDERER DRAFTING PROPOSAL</b>		

1. All the work of applying for certificates or licences required in the project operation should be done by the Contractor, and the Contractor will cover the expense, while the COMPANY will provide necessary help in this process.
2. Any dispute with other party in the operation will be solved on their own and cover all the expense.



## **EXHIBIT 6 - TENDER CATALOGUE**

BIDDERS are required to submit Bid Proposal in the format as described below. BIDDERS are reminded that the Technical Proposal Package **MUST NOT** contain any prices.

### **BID BOUN AND AUTHORIZATION LETTER**

BIDDERS are required to submit **original Bid Bound** and **Authorization Letter** in a sealed separate envelop.

Authorization letter could used BIDDER's format with BIDDER's company letter head.

### **TECHNICAL PROPOSAL PACKAGE**

The Technical Proposal Package shall include, but not limited to, the following:

#### Sub-Section (T1) Covering Letter

As per the format in Exhibit 3

#### Sub-Section (T2) Technical Proposal Form

As per the format in Exhibit 7.

#### Sub-Section (T3) BIDDER's Profile

BIDDER is required to provide information about its company as specified for in ATTACHMENT D, which shall include: -

1. Background of company
2. 2D Acquisition activities
3. Equity/shareholders/Directors
4. Affiliates/principal/subsidiaries company

#### Sub-Section (T4) Capability and Experience

BIDDER is required to provide details of its experience as per the format in Exhibit 9.

#### Sub-Section (T5) Equipments

BIDDER is required to provide information about proposed equipments to undertake the work as specified in the Exhibit I-Scope of Work

BIDDER is required to provide proposed equipments detailed list, equipments procurement contract ,invoice or other certificates that proved that the bidder has the equipments.

#### Sub-Section (T6) Manpower (Personnel) Schedule

Bidder shall provide a complete and detailed listing of Manpower Schedule and CV attached to Technical Proposal.

#### Sub-Section (T7) CONTRACTOR's Proposal for the SERVICES



BIDDER shall submit the following:

Proposal for the Provision of 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES For THE BLOCK ERGEL XII as per Exhibit I (Scope of Work).

BIDDER shall be responsible for all necessary arrangements required in connection with the SERVICES – e.g. statutory permits, issuance of work permits/visas etc for its personnel engaged for the SERVICES, etc.

Sub-Section (T8) Safety Program

BIDDER shall describe its HSE Management System, safety track record and safety award achievement(s) if available.

Sub-Section (T9) Execution Plan

BIDDER shall describe its strategy and submit detailed Execution Plan to mobilize the required equipment and personnel for the Work. BIDDER shall submit the Schedule from award until commencement of the WORK.

Sub-Section (T10) Quality Control of Work

BIDDER shall establish, implement and maintain an effective and documented quality assurance system with respect to the 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES For THE BLOCK ERGEL XI. BIDDER is required to submit the following documentation:

1. Quality assurance manuals of BIDDER's organization and of key Subcontractors
2. Copy of the approval certificate for the quality assurance system from any authority or assessment agency for BIDDER's organization, if available
3. A quality assurance plan

Sub-Section (T11) Exceptions

BIDDER must submit a complete and detailed listing of all exceptions to the Tender Documents.

Sub-Section (T12) Scouting report

- 1 Environmental impacting surveys, particularly in vegetation areas.
- 2 Infrastructure and logistics;
- 3 Local laws, especially, the labor and safety laws;
- 4 Requirements for construction permits and taxes;
- 5 Camp location, mark the position coordinates.

**COMMERCIAL PROPOSAL PACKAGE**

The Commercial Proposal Package shall include, but not limited to, the following:-

Sub-Section (C1) Covering Letter





**SMART OIL MONGOLIA LLC.**

*INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES*

As per the format in Exhibit 3

Sub-Section (C2) Commercial Proposal Form

As per the format in Exhibit 8.

Sub-Section (C3) Financial Capabilities

Financial capability including but not limited to the following:

- Balance Sheet issued by a certified auditor for last three years.
- Profit and loss account issued by a certified auditor for last three years.
- Cash flow reports for the last year issued by a certified auditor.
- Bank statement for the last year reflecting BIDDER's account movement.

Sub-Section (C4) Bid Bond Receipt (copy)

Sub-Section (C5) CONTRACT Price Schedule

As per the format in EXHIBIT 4.

Sub-Section (C6) Exceptions

BIDDER must submit a complete and detailed listing of only the exceptions that have cost and/or time impact in the format provided in EXHIBIT 5.



**SMART OIL MONGOLIA LLC.**

*INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES*

## **EXHIBIT 7 - TECHNICAL PROPOSAL FORM**

Date :

To :

ATTN : TENDER COMMITTEE

Dear Sir,

Invitation to Tender for the provision of seismic data acquisition services

### **INVITATION TO TENDER REF:**

We, the undersigned, certify that we have read and understood the subject Invitation to Bid tender document for **2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES For THE BLOCK ERGEL XII** for SMART OIL MONGOLIA LLC.

We acknowledge that we have thoroughly reviewed the tender document and hereby submit our Technical Bid Proposal for the CONTRACT and therefore we shall be solely responsible for the SERVICES which shall be in accordance with good contractual practice.

We offer to perform the SERVICES as detailed in the tender document as stated in our technical proposal attached hereto.

If our technical proposal is accepted, we undertake that, pending the execution of a formal contract, this Bid Proposal, together with SMART OIL's written acceptance shall constitute a binding contract between us.

Yours truly,

Signature:

Name:

Position:



**SMART OIL MONGOLIA LLC.**

*INVITATION TO TENDER FOR 2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES*

## **EXHIBIT 8 - COMMERCIAL PROPOSAL FORM**

Date :

To :

ATTN : TENDER COMMITTEE

Dear Sir,

Invitation to Tender for the provision of seismic data acquisition services

### **INVITATION TO TENDER REF:**

We, the undersigned, certify that we have read and understood the subject Invitation to Bid tender document for **2D SEISMIC DATA ACQUISITION & IN-FIELD PROCESSING SERVICES For THE BLOCK ERGEL XII** for SMART OIL MONGOLIA LLC.

We acknowledge that we have thoroughly reviewed the tender document and hereby submit our Commercial Bid Proposal for the CONTRACT and therefore we shall be solely responsible for the SERVICES which shall be in accordance with good contractual practice.

We offer to perform the SERVICES as detailed in the tender document for the prices stated in our proposal attached hereto. This offer is valid for One Hundred Twenty (120) days from the date fixed for Bid Closing and shall be binding to us if accepted by SMART OIL at any time before expiration of the aforesaid validity date.

For extension of bid validity period beyond the date specified above, the price adjustment, if any, shall be as follows:

If our proposal is accepted, we undertake that, pending the execution of a formal contract, this Bid Proposal, together with SMART OIL's written acceptance shall constitute a binding contract between us.

Yours truly,

Signature:

Name:

Position:



**EXHIBIT 9 - BIDDER'S EXPERIENCE FORM**

In order to gauge the experience level of BIDDER, BIDDER must provide the following detail of their services, experience, and complete the table attached herewith for this purpose:-

1. Contracts for provision of similar services that had been executed by BIDDER.
2. Client (company) to whom they said services had been provided.
3. The Duration of each contract.
4. The Contract Value (state in what currency)

No	Contracts Undertaken	Name & Address of Client	Contract Duration		Contract Location / Country	Contract Value (State Currency)
			Start Date	End Date		



## **SECTION C – HEALTH, SAFETY & ENVIRONMENT**

Tenderer is requested to supply the following as part of the tender submission:

- Copy of Corporate HSE Policy
- Lost Time Incident (LTI) and Total Recordable Injury Frequency Rate (TRIFR) for the past 3 years
- List of significant incidents during the past 3 years
- Copy of HSE Management System
- Copies of Tenderer's Quarterly Reports for the past 12 months
- Copies of Annual Corporate HSE Reports for the past 3 years

### **1 POLICY ON SAFETY, HEALTH AND ENVIRONMENT**

#### 1.1 Policy Statement and Objectives.

Contractor will conduct its operations in such a manner as to:

- Provide a safe working environment.
- Ensure the safety and health of Contractor's Personnel and other individuals working within the Contractor directed areas of operation.
- Protect the public from injury or ill health and prevent loss or damage to properties resulting from its activities.
- Ensure and safeguard the conservation of the environment.

#### 1.2 Safety Targets

In taking steps to ensure a safe working environment, COMPANY and Contractor Personnel are to aim for:

- No fatalities;
- Prevention of loss time and any significant accidents.

#### 1.3 Implementation Aspects

**THE POLICY IS IMPLEMENTED WITH SPECIAL ATTENTION TO THE FOLLOWING SPECIFIC ASPECTS:**

- The requirements of all relevant government legislation are followed;
- COMPANY standards, specifications, procedures and regulations are applied;
- Safety is given equal importance to productivity and cost;
- Each employee is given specific procedures related to his work;
- Each employee receives suitable technical and safety training;
- Work instructions are clear and pay due regard to safety requirements;
- Experience gained, lessons learned from accidents/incidents and new technical developments to be widely distributed amongst staff;



- To apply and maintain the "Regulations for Protection of the Environment in the Petroleum Industry in Mongolia";
- To submit measures and standards in practice in regard to the protection of the Environment, Safety and Health to COMPANY, that complies with COMPANY policy and standards;
- To maintain an effective HSE Management System that covers all aspects of the activities;
- To maintain complete documentation of all procedures and manuals relating to the work, including accident/incident reporting;
- Shipments of regulated hazardous materials to COMPANY must be consigned to COMPANY's destination in full compliance with shipper and carrier responsibilities as stipulated by the applicable international, national, provincial and local laws/regulations/practices, relating to packaging, documentation, handling, use, storage and disposal.

## **2 SAFETY MEETINGS AND AUDITS**

### 2.1 Safety Inspections/Audits

- Contractor's equipment shall meet all COMPANY safety specifications and regulations.
- Prior to beginning any part of the Work, the COMPANY Representative may inspect Contractor's equipment. If safety concerns are discovered, subsequent inspections shall be made to ensure that proper actions have been taken to rectify earlier identified unsafe situations and that equipment is in working order.

### 2.2 Safety Awareness / Meetings

Contractor must participate in regular safety meetings / briefing and emergency drills. The objectives of safety meetings are to:

- Provide opportunities for Contractor Personnel to voice their concern over unsafe situations or procedures in their respective work places.
- Provide information and warning for other personnel in regard to potential or existing hazards.
- Allow collective solutions to be put forward through discussion.

It is COMPANY's requirement that all Contractor Personnel attend regular safety meetings and names of attendees shall appear on the minutes of such meetings. Non-attendance at a safety meeting must be authorized by a responsible person and a reason for non-attendance must be given in the minutes.

## **3 REPORTING**



Contractor shall report all accidents and incidents related to the Work in accordance with COMPANY Accident Reporting Procedure, within twenty four (24) hours in the event of:

- a) Any loss of or damage to material or equipment supplied by COMPANY Personnel.
- b) Any personal injury to any COMPANY or Contractor Personnel, its agents or Subcontractors.
- c) Any injury to any third party.
- d) A near miss incident.
- e) A fatality accident involving any COMPANY or Contractor / Subcontractor Personnel **shall** be reported within twelve (120 hours of accident to the COMPANY Representative.

#### **4 SAFETY TOOLS AND EQUIPMENT**

4.1 Contractor shall use correct, properly designed and serviceable tools and safety equipment as required. All Contractor Personnel should be taught the proper and correct way of using safety tools and equipment.

##### 4.2 Protective Equipment

- All protective equipment shall be of types manufactured to the acceptable HSE standards as per the guideline of COMPANY's PPE policy and procedures.
- Contractor Personnel shall wear safety shoes and hard hats at all operation areas.
- Contractor Personnel shall wear face shields, eye goggles or welding shields as appropriate and as per COMPANY policy.

#### **5 HOUSEKEEPING**

Contractor shall ensure that good housekeeping and cleanliness in the accommodation and Worksite is maintained.

#### **6 EMERGENCY EQUIPMENT AND PROCEDURES**

Contractor's Personnel shall comply with all COMPANY Emergency Response Plan (ERP) procedures and conduct their response as required.

#### **7 ACCIDENT REPORTING AND INVESTIGATION**

7.1 For the purposes of this Article 7 of this Exhibit, "Accident" shall mean any unintentional or unplanned event or condition, which has or could have resulted in injury to a person or loss or damage to equipment, plant or property.



7.2 All accidents or incidents, no matter how trivial, must be reported to COMPANY Representative. Contractor shall ensure that its Personnel are aware of this requirement.

7.3 Contractor shall assist COMPANY in any accident investigation if so required. COMPANY may call for a joint investigation with Contractor if necessary.

7.4 Prior to commencing the Work, Contractor shall either:

7.4.1 have Accident reporting and investigation procedures, if applicable, and shall maintain accident statistics which shall be compatible with COMPANY Accident Reporting Procedures; or

7.4.2 adopt the current COMPANY Accident Reporting Procedures.

7.5 Contractor shall submit the basic safety information to the COMPANY Representative not later than the first day of the month following the month under review, by telex or fax.

## **8 ALCOHOL/ DRUG POLICY**

8.1 Contractor Personnel shall not perform any Work for COMPANY while under the influence of alcohol or any controlled substance. Contractor's Personnel shall not misuse legal drugs or possess, use, distribute, or sell illicit or un-prescribed controlled substances or drug on COMPANY businesses or premises. Contractor shall adopt and enforce work rules and policies in order to assure compliance with these obligations.

8.2 While on premises owned or controlled by COMPANY, COMPANY reserves the right to conduct searches for the possession of drugs and/or alcohol on the person, in vehicles, and in other property of Contractor and its Personnel. Any person who refuses to cooperate with any such search shall be removed from the premises and not permitted to return.

8.3 Contractor shall require its Personnel to submit to medical evaluation or alcohol or drug testing where cause exists to suspect alcohol or drug use.

8.4 Contractor shall remove from COMPANY's premises any of its Personnel who either refuse to participate in medical evaluation or alcohol or drug tests, or who test positive for alcohol or another controlled substance. Such Personnel shall not be permitted to perform any further Work with COMPANY.





8.5 Contractor shall maintain strict discipline and good order among its Personnel, and shall not permit any of them to engage in activities that COMPANY deems contrary or detrimental to COMPANY interests. If COMPANY should request that any Personnel of Contractor or of Subcontractors be removed from COMPANY property or Work site pursuant to this Contract for any reason, Contractor shall accede to such request and shall provide a replacement acceptable to COMPANY at no additional cost to COMPANY.

8.6 In the event Contractor fails to comply with these obligations, COMPANY shall have the right to terminate this Contract.

## **9 MEDICAL WELFARE**

9.1 Contractor shall ensure that all its Personnel assigned for the performance of the Work are medically fit and healthy. Any medical disabilities including such disabilities which Contractor may consider will not adversely influence the person's ability to perform his role in the Work should be reported to COMPANY prior to the start of the Work. Contractor, if requested by COMPANY, shall provide medical certificates for Contractor and Subcontractor Personnel.

9.2 Contractor shall subject its key Personnel and its Subcontractor Personnel to regular medical examination at Contractor's cost. Records of such examination shall be made available to COMPANY on request.

9.3 Subject to the other terms of this Contract, Contractor shall at no cost to COMPANY be responsible for the medical welfare of its own Personnel and shall take care of arrangements for medical attendance treatment or hospitalization if and when necessary and will arrange suitable insurance coverage for such contingencies.

9.4 Contractor is to ensure that all its Personnel are informed of whatever first aid facilities are available at the Worksite. In the event of emergency, COMPANY shall support Contractor's own arrangements if necessary.



**SMART OIL MONGOLIA LLC.**

**HSE Charter**



To achieve our objectives of:

- Achieving full compliance with the SMART OIL MONGOLIA LLC. HSE Policy.
- Fully complying with all legal requirements.
- Striving to achieve the highest standard of HSE performance.

We will:

- Provide a safe working environment and safe systems of work.
- Actively try to eliminate all unsafe acts and behaviors.
- Train and restrain our employees to the required level of competence.
- Assess the risks of all our activities and ensure acceptable controls are in place.
- Focus on proactive measurement of HSE performance and strive for continuous improvement.
- Reward positive contributions and only use the disciplinary code for willful violations of standards
- Involve everyone in SMART OIL MONGOLIA LLC. in developing and maintaining HSE standards and performance including stopping any activity that is unsafe or not meeting the COMPANY's standards.
- Implement planned and unplanned work to the same high HSE standards.
- Employ only competent contract companies and engage them in the COMPANY's HSE standards.
- Allocate finances and resources as necessary to comply with the COMPANY's HSE standards.
- Actively seek learning opportunities by reporting and investigating all incidents(including near misses) to identify root causes.