Annexure-A

TERMS OF REFERENCE (TOR)

FOR

ACQUIRING SHALE FRACTURING SERVICES

TENDER ENQUIRY # PROC-SERVICES/CB/PROD-4512/2019

HIRING OF FRACTURING SERVICES FOR SHALE

SCOPE OF WORK AND TERMS OF REFERENCE (TOR)

1. INTRODUCTION

OIL AND GAS DEVELOPMENT COMPANY LIMITED (OGDCL) INTENDS TO EXECUTE A CONTRACT FOR PROVISION OF FRACTURING SERVICES, (OPEN HOLE AND CASED HOLE) FOR SHALE FORMATION AT ALL OGDCL OPERATED FIELDS/BLOCKS FOR A PERIOD OF THREE (03) YEARS ON RATE RUNNING (AS AND WHEN REQUIRED) BASIS.

The company is looking into the option of carrying out Fracturing Services through open hole or cased hole completions on suitable candidate wells. The intended activities will be carried out with Rig or Rigless as feasible. The candidate wells are expected to produce anything from dry gas, gas condensate to crude oil. Bids are invited to provide specialized services, expertise, materials and equipment to effectively design and implement fracturing treatment including mini-Frac/Data Frac/Main Frac on shales in OGDCL anywhere in Pakistan.

2. TECHNICAL DATA:

2.1 The candidate wells are identified in various field locations in Pakistan with varying degrees of anticipated reservoir pressures, temperatures and depths.

2.2 Expected ranges of anticipated target reservoir and well parameters are as under:

- 2.2.1 Expected Reservoir Pressures may be upto 12,000 psi.
- 2.2.2 Reservoirs might have depleted (below hydrostatic) to over pressured (above hydrostatic).
- 2.2.3 Expected Reservoir Temperatures may be upto 320 ^{0}F.
- 2.2.4 Expected Reservoir Depths may be upto 6,000 M.
- 2.2.5 Reservoirs will be unconventional shales.
- 2.2.6 Reservoirs are expected to produce dry gas, wet gas, gas condensate, volatile oil or crude oil with or without active aquifer present.
- 2.2.7 Expected Presence of H_2S: upto 7 %, CO_2: upto 40 % and N_2: upto 33 %.
- 2.2.8 Reservoirs are expected to lie in areas of low to high tectonic activity with wells encountering nearby faults.

3. TENTATIVE WORK PLAN:

Sr.	Expected No. of wells	Type of Well	Expected No. of Frac Stages/well	Total Frac-Stages	Job
1	2	Vertical	3	6	Breakdown/Mini-frac/Data-frac
2		Vertical	3	6	Main Frac Treatment
3		Horizontal	17	34	Main Frac Treatment

4. SCOPE OF WORK FOR BIDDERS:

Scope of work includes but not limited to the following:

4.1 Candidate Selection & Evaluation

Review of the fields/wells data provided by the OGDCL, short list and finalize wells suitable for frac execution in terms of completion and work-over requirements (e.g tubing, packer, isolation plugs, perforations, wellhead requirements, sand plugs etc.), identify additional data requirements which could be provided if available. Advise about the feasibility for Multi stage completion if required.

4.2 Treatment Design and Optimization

- 4.2.1 Design optimized treatments (Volume and recipe) for respective wells.
- 4.2.2 Carry out necessary modeling to estimate the post treatment production attributes with a reasonable degree of accuracy, before and after the stimulation job.
- 4.2.3 Provide a detailed report on treatment design.
- 4.2.4 Provide expertise and knowledge to carry out fracturing and stimulation jobs using latest technologies.

4.2.5 Provide necessary experienced personnel, equipment and materials to effectively execute the designed job.

4.2.6 Provide detailed programs for the planned treatment and activities.

4.2.7 Provide detailed reports, accurately describing the treatment implementation, assessment and future recommendations.

4.2.8 Provide support in acquisition and interpretation of key data required for the formulation of the Mechanical Earth Model and assessment of specific reservoir conditions and characteristics.

4.2.9 Carry out necessary pre-job testing and data acquisition to facilitate and ascertain treatment design parameters, chemicals and job performance.

4.2.10 Provide post treatment support to assess job performance and remedy unplanned and unfavorable job impacts.

4.3 Frac job Design

Frac designs shall include detailed fracturing program with frac completion requirements, pumping schedule & specifications of frac chemicals like Frac recipes. Contractor shall design and analyze Mini FRAC. Fracturing design shall be fine-tuned based on MiniFRAC results and lessons learnt from previous frac jobs. Contractor should be capable of simulating frac geometries in 3D frame. The contract shall provide following for Frac design.

4.3.1. Designing frac job using industry accepted/ prevalent software.

4.3.2. Design & provide the step by step detailed fracturing program which shall include pumping schedule and contingencies.

4.3.3. Shall have the capability to carry out analysis of the water, flow back fluids, formation cutting sample analysis for use during fracturing and shall recommend the same at the design and execution stage.

4.3.4. The Contractor shall develop the frac design based on quality of reservoir (whichever dataset is available), establish frac gradient, Fracture Closure Pressure, simulate fracturing pressures, elastic properties, complete stress profile & stress barriers and advise about completion selection in the light of simulated parameters.

4.3.5. Contractor shall identify and design optimal propped fracture half-length including:

- Frac Height
- Average Propped Width
- Effective Conductivity
- Post Frac Hydrocarbon Profile / Production Forecast
- Flow Back Monitoring Strategy

4.3.6. Contractor shall estimate the cost and submit financial proposal to OGDCL sufficiently ahead of each job.

4.3.7. Contractor shall select & provide suitable Frac fluid & proppant, based on:

- BHT & BHP
- Lithology
- Fluid Compatibility
- Adequate Rheology
- Designed Effective Conductivity
- Cross Linking Process
- Fluid Loss Additives
- Proppant Flow Back Control Additives

4.3.8. Contractor shall provide full and complete support to the Company's supervisor to analyze the following during main frac treatment and enabling him to take on-spot decisions regarding:

- Injectivity / Breakdown
- Transmissibility Analysis Using Mini Frac Data
- Step Rate Test (Closure Pressure, Extension Pressure)
- Decline test (Closure Pressure, Fluid Efficiency)

4.4 Hydraulic Frac Fleet

The Contractor must have hydraulic frac fleet complete (as mentioned in technical evaluation criteria) in all respects with sufficient backup, capable of fast rig up & having a minimum of 16,000 hydraulic horsepower (Own + third party) and commitment to arrange 20,000 hydraulic horsepower pumping capacity either own or through third party contract at well site if required as per design, maximum of 15 Days of Issuance of mobilization notice. The contractor must have capability of handling surface pressure upto15,000 psi and be able to pump proppant (PPA 0.1 to 12) at the rate of 40 bpm or more.

4.5 Post Frac Job Review

The Contractor shall conduct detailed post frac review of each well, present it to the OGDCL and submit report incorporating all the details of the executed job and learning for the next frac jobs.

4.6 Fracturing Process – Campaign

4.6.1 Contractor to clearly communicate & submit the screening, selecting & upgrading criteria for fracturing treatment to OGDCL for approval.

4.6.2 Contractor shall evaluate, screen & select feasible frac candidates and submit their proposal to OGDCL for approval with clearly defined reasons for selecting or not selecting candidate wells.

4.6.3 Contractor shall submit the frac designs of approved candidate wells to OGDCL for approval sufficiently prior to job.

4.6.4 Contractor shall select and provide suitable Frac recipes with the lab test results for fluid and proppant at bottom hole reservoir conditions (including but not limited to HTHP rheology and proppant crush test, with tracking proof) for approval to OGDCL.

4.6.5 Contractor shall design, execute and analyze MiniFRAC on each selected well after approval from OGDCL.

4.6.6 Contractor shall submit any required modifications in frac designs after MiniFRAC analysis for approval.

4.7 Coil Tubing/Smart/E-Coil and Associated Services:

4.7.1 Contractor will provide the Smart /E-Coil services to be utilized for perforation along with OGDCL/Third party perforating guns.

4.7.2 Contractor will provide the Smart/E-coil services to be utilized for setting of copper head bridge plugs required for zonal isolation.

4.7.3 Contractor will provide the Coil tubing services along with necessary BHA to be utilized for milling and circulating out of **Copperhead Drillable bridge and frac. plugs.**

4.8 Abrasive/Abrasi or equivalent jetting Pumping Services

4.8.1 Contractor to provide Abrasive/Abrasi or equivalent Pumping services as per job requirement.

4.9 15 K Copperhead Drillable bridge and Frac. Plugs including services:

4.9.1 Contractor shall provide the 15 K Pressure Rating Copperhead Drillable bridge and frac. Plugs at well site, as many as required as per design for 4.5” and 5” casing sizes.

4.9.2 The contractor shall provide the services of wireline adaptor kit and crew for setting of Copperhead Drillable bridge and frac. Plug.

4.10 Materials and Chemicals:

4.10.1 As per job specifications, arrangement of materials for the planned activities shall be the responsibility of the Contractor having a proven track record of delivering uninterrupted supply of material, proppant & chemicals from a reputable manufacturer.

4.10.2 The Contractor will provide chemicals and materials:

4.10.2.1 To be used in low to high pressure reservoirs.

4.10.2.2 To be used in low to high temperature reservoirs.

4.10.2.3 To be used in low to high stress environments.

4.10.2.4 Third party vendor certifications of materials and chemicals.

4.10.2.5 Additional 15 - 16% proppant and chemicals to the design requirement at location, to accommodate change in job design.

4.10.2.6 Onsite materials (Proppant & Frac Fluid additives, etc.) shall be of same batch & Lot numbers as per fluid lab testing reports.

5. TERMS AND CONDITIONS

5.1 The scope of work is tentative, OGDCL reserve the right to increase or decrease the scope of work without change in prices and terms & conditions.

5.2 Bidder must agree and give clean acceptance to all the Operational and Financial Terms & Conditions and Technical Specifications & Personnel requirements set forth in this tender document.

5.3 The bidder to establish equipment base and Maintenance Facility set up in Pakistan maximum of 30 days after signing of contract or Upto March 2020 whichever comes first.

5.4 Equipment, tools and experienced personnel covering full scope of services must be available with the bidder in Pakistan or abroad at the time of submission of bid. In case of availability outside Pakistan, bidder shall make equipment, tools and personnel covering full scope of services available in Pakistan maximum of 30 days after signing of contract or upto March 2020 whichever comes first.

5.5 The maximum mobilization period to mobilize equipment and crew to well site is 15 days after job finalization.

5.6 All certificates, documents, proof of work etc. should be in English language, if not then they shall be accompanied with certified translation to English language to be considered for evaluation.

5.7 The Bidder to confirm the possession of at least one (01) set of complete fracturing setup with sufficient backup to perform fracturing job. The complete fracturing setup with backup must be made available in Pakistan throughout the contract period.

5.8 Adequate back-up services / equipment should be available on site free of cost to avoid delay in operations.

5.9 A free of cost visit to wellsite prior to start of any operation need to be made by bidder to provide feedback for any required arrangements.

5.10 All equipment/tools quoted by the bidder must be in good working condition with valid inspection and calibration certificate(s) for the performance of job(s). OGDCL reserves the right to inspect quoted equipment and tools as part of technical evaluation.

5.11 Bidder, to provide SOFT as well as Hard Copy of the TECHNICAL PROPOSAL.

5.12 The Bidder to confirm compliance with OGDCL's QHSE Policy.

5.13 Personnel must be:

5.13.1 Sufficiently experienced to efficiently carry out the intended tasks.

5.13.2 Be able and willing to work anywhere in Pakistan.

5.13.3 Capable to carry out 24 hours Frac operations.

5.14 Contractor must provide suitable equipment:

5.14.1 To meet the high pressure pumping requirements.

5.14.2 To meet the high rate pumping requirements.

5.14.3 To meet low rate pumping requirements.

5.14.4 That is versatile and rugged enough to perform job in extreme environments.

5.14.5 Suitable for sour services.

5.14.6 For performing operations with Rig and in Rigless environments.

5.14.7 For pumping volatile and abrasive materials and chemicals.

5.14.8 For complementing the available on-site equipment such as cross-overs and frac trees, copper head bridge plugs etc.

5.15 Arrangement of Materials and Chemicals for the planned activities shall be the responsibility of the contractor. The contractor will be required to make arrangement of chemicals and materials:

5.15.1 To be used in low to high pressure reservoirs.

5.15.2 To be used in low to high temperature reservoirs.

5.15.3 To be used in low to high stress environments.

5.15.4 To be used in Conventional and Unconventional Reservoirs.

5.15.5 From third party vendors in case not available with the contractor along with third party certifications of the materials and chemicals.

5.15.6 To handle the post job issues as per best industry practices (proppant flow back control materials, polymer damage and emulsion treating materials etc.).

5.16 Contractor shall carry out necessary pre job lab testing and data acquisition to facilitate and ascertain treatment design parameters witnessed by OGDCL representative.

5.16.1 Carry out pre-job water analysis.

5.16.2 Carry out all required pre-job frac fluid testing on location.

5.16.3 Carry out proppant sieve analysis.

5.17 Provide post treatment support to assess job performance.

5.18 Any bidder offering services in alliance with other contractor shall be evaluated accordingly.

5.19 All responsibility shall rest with the contractor for any third-party equipment and personnel supplied by the contractor.

5.20 OGDCL shall not be accountable for any personnel injury during Mob/De-mob, loading, offloading and during the course of operations at wellsite. Health insurance of the offered crew will be the responsibility of the bidder.

5.21 Bidder to arrange all safety equipment/services at their own for their personnel's whichever is required by them for working in extreme H2S environment with no additional cost to OGDCL.

5.22 Treatment / management of hazardous gases and waste water/material if any will be the responsibility of contractor without any additional cost to OGDCL.

5.23 All third-party equipment supplied must be accompanied with applicable quality and safety standards and/or pressure control manual.

5.24 Bidder must quote the cost of every item of financial bid format otherwise incomplete bid will not be entertained. Bidder must strictly follow and quote prices as per financial bid format. No clause with "if & but" having financial impacts will be entertained and in such case bid will be treated as non-responsive.

5.25 A price list of additional / relevant equipment / services/chemicals must be provided with the bid document, which will be used for reference purpose for obtaining additional approvals whichever is required for utilization as per actual requirement. However, the prices should not be included in Financial Bid Format. In case of any deviation from financial bid format the bids will be declared non-responsive.

5.26 The bidder is required to submit the post job report maximum of one month after execution of job, otherwise invoices will not be accepted for payment.

5.27 Crew charges shall cover full crew as required for the said services. No additional charges shall be paid for any additional personnel whatsoever.

5.28 Equipment Charges/Pumping Charges shall cover for full setup as required for the said services. No additional charges shall be paid for any additional equipment whatsoever.

5.29 If any of the equipment fails/breaks down during operation at wellsite and causes delay, no operating and standby charges for crew/equipment shall be paid during shut down period.

5.30 If main frac job was performed on the well, the charges for BDI/CI will not be applicable.

5.31 If company was mobilized for MFT but only BDI/CI test was performed than OGDCL will pay charges as per rates quoted for BDI/CI however, Mob/Demob for main frac equipment and crew will be paid.

5.32 OGDCL shall not be liable to pay mobilization/demobilization charges of any tools/equipment for bringing them to Pakistan that may be located elsewhere.

5.33 Mob/De-Mob Charges (Per Km) will be calculated according to the distance as per OGDCL distance chart. Mob/De-mob of equipment and crew will be paid as per actual i.e. location from where the equipment and crew are mobilized in Pakistan.

5.34 Lighting at well site is to be arranged by the contractor.

5.35 BDI/CI/MFT equipment must be equipped with Mobile/Field laboratory and Remote Real Time Data Transmission/Acquisition system.

5.36 If, after mobilization, job is cancelled before reporting at site than only job cancellation charges will be paid. No mobilization / de-mobilization and stand by charges for crew / equipment will be paid.

5.37 If, after mobilization, job is cancelled after reporting at site than job cancellation charges along with mobilization / de-mobilization charges for both crew and equipment will be paid. No stand by charges for crew / equipment will be paid.

5.38 No job cancellation charges shall be paid if the call out is cancelled before the equipment is mobilized from the contractor's base.

5.39 Rig up, Rig down and Chemical mixing period will be considered as standby for both equipment and crew.

5.40 Fracturing Crew will be paid operating charges on the day of fluid pumping.

5.41 There will be no standby of equipment on the day of fluid pumping.

5.42 Partial availability of crew or equipment will not attract any charges.

5.43 During traveling (mobilization/de-mobilization) days, no operating/stand-by/rental charges will be admissible and only Mob-De-Mob will be payable. Operating charges will be applicable only if job started on same day.

5.44 Daily Operating and standby rate of equipment and crew for all days must remain uniform.

5.45 Bidder must quote standby charges for equipment and crew not more than 50% of operating charges otherwise bids will be declared non-responsive.

5.46 The services in this contract are to be utilized as a package, if any service against this contract is being utilized, standby charges for rest of the services (both equipment and crew) will not be applicable.

5.47 Number of wells, frac stages, number of days and quantities mentioned are for evaluation purposes only. Payment will be made as per actual job.

5.48 Design Optimization Charges (including but not limited to Candidate Selection, Mechanical Earth Model, 3D Frac Modeling, Production forecasting etc.) will be only applicable if MFT job executed, incase MFT job is not executed designing charges will not be applicable.

5.49 Design optimization charge if applicable shall be paid once per well regardless of number of stages per well.

5.50 OGDCL reserves the right to call for Breakdown Injection (DFIT/Injectivity), Calibration (MiniFRAC/DataFRAC) & MainFRAC treatments separately and charges shall prevail accordingly as per the services requested.

5.51 For PropFRAC/acidFRAC services, recipe must contain chemicals for maximum duration tubing protection and iron control.

5.52 Fluid charges shall be paid as per volume mixed onsite and verified by OGDCL onsite representatives and proppant shall be paid as per physically pumped in the well.

5.53 If equipment/material which is not covered in this contract is air freight on OGDCL request to meet urgency before agreed time line of job, charges will be paid as per actual.

5.54 The lost in hole (LIH) will be paid by OGDCL as per following criteria subject to the condition that there is no malfunctioning of service company equipment and loss is due to abnormal well conditions.

- 40 % of Landed cost of Equipment/tools which are less than three years old.
- 30% of Landed cost of Equipment/tools which are equal to or more than three years old.

5.55 If during job, it is ascertained that the service company is unable to perform / accomplish the job satisfactorily, OGDCL reserves the right to demobilize the service company. Invoice for unsuccessful jobs will not be entertained for any payment.

5.56 Fuel, oil, chemicals, items (proppant etc.), water, lubricants and transport that may be required by service company for operational purpose will be charged to service company as per actual and the cost will be deducted from the invoice.

5.57 Boarding / Lodging, laundry and security services would be provided free of cost by OGDCL to the service company crew while working in the field.

5.58 OGDCL reserves the right to ask bidder for the replacement of any of their personnel who is / are unacceptable to OGDCL for his / their incompetence or misbehavior at Contract holder's expense.

5.59 OGDCL reserves the right to accept or reject any/all bid (s) or annul the entire bidding process at any time prior to award of Contract without taking any responsibility of the affected bidder(s) and is not bound to justify the reasons to the affected bidder(s).

6. Duration of Contract:

6.1 The contract will be on rate running (as and when required) basis. The duration of the contract will be initially for three (03) years from the date of mobilization to the first well, or till completion of jobs on two (02) wells whichever comes later. Further extension in the contract will be made based on mutual consent of both parties in writing.

6.2 The Bid proposal/rates should remain valid unconditionally during the period of contract.

7. Payment Terms:

7.1 The payments to the Service Company will be made through cross cheque in 100% Pak Rupees, at actual, against verified invoices at official exchange rate prevalent on the date of payment.

7.2 The prices quoted by bidder in financial bid should be in US$. The quoted price should be fixed/firm and are inclusive of all applicable taxes, duties and Levies etc. except Provincial Sales Tax/ICT Tax on Services.

8. Bid Bond:

8.1 Bid Bond/Bid Security amounting to **USD 300,000/-** (US Dollars Three Hundred Thousand Only) is to be attached/provided **with Technical bid**. Please see Master Set of Tender Document for further details.

9. Mode of Procurement:

9.1 Bids against this tender are invited on "**Single Stage Two Envelope Bidding Procedure"** through press tendering, therefore, the bidders shall submit original and copy of their Technical and one original Financial bid.

Note: The Master Set of Tender Documents for Services uploaded on OGDCL's website (www.ogdcl.com) is the integral part of this TOR.

10. DOCUMENTATION FOR TECHNICAL EVALUATION

Bidders are required to certify operational worthiness and provide the following documents:

10.1 Equipment

Following details for all equipment to be provided for technical evaluation at OGDCL:

10.1.1 Age of Equipment

10.1.2 Make and model of Equipment

10.1.3 Equipment certification with full specifications, maintenance history, and pressure test certificates where necessary, etc.

10.1.4 Equipment work history.

10.1.5 Complete equipment specifications.

10.1.6 Details of lab and testing services available (clearly identifying the facilities available in house & on site) to help gather relevant information to design optimized treatments

10.1.7 Pressure, Temperature and operational ratings.

10.1.8 Point of origin of the equipment and the time period required for mobilization.

10.2 Proppant, Chemicals, Frac & Acid Fluids

Following details for proppant, chemicals, frac fluids are to be provided to OGDCL for the frac jobs:

10.2.1 Proppant Crush tests for recommended proppant as per design.

10.2.2 Rheology, Pressure and Temperature limitations of frac fluids with additives (for fluids recommended as per design).

10.2.3 If the material is being acquired from third party vendor, the Contractor will be required to provide the manufacturer details, brand name and third party certification for quality and consistency.

10.3 Company Profile

Following details are to be provided specifically with respect to fracturing jobs undertaken by the bidder:

10.3.1 Total number of jobs executed globally.

10.3.2 Case Histories of Fracturing and Stimulation Jobs successfully completed around the globe (in the last 5 years) in conventional and unconventional reservoirs.

10.3.3 Case Histories of Fracturing and Stimulation Jobs successfully completed locally in Pakistan (in the last 5 years) in conventional and unconventional reservoirs.

10.3.4 Customers appreciation letters.

10.4 Personnel

Detailed CV's of all personnel intended to be deployed for this project shall be provided to the Company including:

10.4.1 HSE / technical training details.

10.4.2 Proficiency evidence of spoken and written English.

10.4.3 Able and willing to work across, Pakistan.

10.5 Health, Safety & Environment

Contractor shall be responsible & accountable for all HSE aspects of the mobilization / De mobilization & execution of the frac services. The following details are required with respect to HSE adherence by bidder:

10.5.1 HSE training & certifications

10.5.2 HSE records and statistics

10.5.3 Hazardous material handling & transportation procedures

10.5.4 Hazard identification & risk analysis

10.6 Key Performance Indicators (KPIs)

10.6.1 Equipment

All equipment shall be fully tested and pre-checked at base before mobilizing to location. OGDCL will not carry out job with substandard equipment.

10.6.2 Material

All materials (proppant/chemicals) shall be available, inspected and quality-checked at base before mobilizing to location. OGDCL will not carry out jobs with substandard material.

11. TECHNICAL EVALUATION

All the bidders are required to provide a compliance certificate to the following. The Bidder must fulfill the below mentioned Minimum requirements for Technical Qualification. Non-compliance any of the followings Mandatory/Minimum requirement shall lead to Technical disqualification. Confirmation is required from the bidder to all the mentioned Frac. /Allied Services and Terms & conditions.

EQUIPMENT/ TOOLS (All Equipment must H2S Complaint)

Sr.	Description	Availability
1	**FRAC PUMPING CAPACITY** 16,000 HHP or equivalent pumping capacity in working condition suitable for pumping corrosive, abrasive and non-corrosive fluids with minimum of 15,000 Psi working pressure. Pumping capacity min 5bpm each pump. Provide documentary Evidence. If available outside Pakistan than commitment to shift to Pakistan maximum of 30 days after signing of contract or upto March 2020 whichever comes first. Minimum 12,000 HHP Own working capacity required to be shifted to Pakistan while remaining can be arranged locally through third party contract. Valid third party contract over period of 4 years is required for third party arrangements. In some cases pumping capacity upto 20,000 HHP may also be required, contractor to provide affidavit regarding arrangement of 20,000 HHP as per design wherever required maximum of 15 days of mobilization notice.	Yes/No
2	**Blender(s) (Company Owned and available elsewhere globally)** Capable of blending and pumping up to 50-60 bpm of fracturing slurry. Capable of transmitting real time data of parameters to acquisition system related to pumping.	Yes/No

	If available outside Pakistan than commitment to shift to Pakistan maximum of 30 days after signing of contract or upto March 2020 whichever comes first.	
3	**Hydration Unit / PCM** Capable of blending and pumping up to 50-60 bpm (for polymer loading upto 7.2 S.G) of fracturing base fluid (comprising of brine, polymer and required liquid additives) and transmitting real time data of parameters related to pumping to acquisition system. The Mixer must continuously meter and hydrate the polymer by blending it with water and maintain constant hydrostatic head for the blender. If available outside Pakistan than commitment to shift to Pakistan maximum of 30 days after signing of contract or upto March 2020 whichever comes first.	Yes/No
4	**Frac Tanks (Company Owned/Third Party and available elsewhere globally)** Minimum on-site non-corrosive fluid storage capacity = 8,000 bbl Minimum on-site corrosive fluid storage capacity = 1,000 bbl If available outside Pakistan than commitment to shift to Pakistan maximum of 30 days after signing of contract or upto March 2020 whichever comes first. In case of third party arrangement, please provide valid contract over period of 4 Years.	Yes/No
5	**Electronic Data Acquisition System** (**Company Owned and available elsewhere globally)** Ability to remotely control the fracturing operation at wellsite. Acquisition and transmission of real time data remotely to OGDCL office from any location. If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days of signing of contract or upto March 2020 whichever comes first.	Yes/No
6	**Electronic Pressure Transducer** 15 K rating Annulus and tubing/casing pressure gauges.	Yes/No
7	**Portable Laboratory Cabin/Frac Van (Company Owned and available elsewhere globally)** Field lab to QC slurry/fluid being pumped must be equipped with following • Fann35 viscometer (or equivalent). • HPHT Rheometer (for measuring rheology at simulated downhole conditions). • Blender w/ adjustable rheostat to control mix speed. • Properly calibrated digital pH probe (capable of measuring upto 0.1 pH unit). Narrow range pH (5-8 and 8-12) paper as back-ups for the meter and to provide an additional calibration of the pH meter • Thermometer • Graduated cylinder or similar for liquid measurement • Standard water analysis kit • 1 mL – 10 mL plastic syringes • Suite of sand screens to perform API spec sieve analysis • Stopwatch • Weight Balance • Heat bath and/or microwave to heat samples and confirm activity of thermal cross-linker. • Containers to collect onsite samples of all chemicals • Digital lab weight scale (accurate upto 0.001 gms) • Density measurement device • Performing sieve analysis for proppant • Mud balance scale Calibration documents for all equipment should be made available at wellsite. If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days of signing of contract or upto March 2020 whichever comes first.	Yes/No

8	**Regional Lab** Capable of simulating downhole pumping conditions. All fluid formulations for proposed well should be validated by tests performed at this lab. Not only must every recipe be validated and documented, but every chemical batch or lot should be tested as well. Capable of doing water analysis from the source identified by client. Required equipment includes FAN 50.	Yes/No
9	**High Pressure Fracture Manifold (Company Owned and available elsewhere globally)** Min 15,000 psi ratings If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days of signing of contract or upto March 2020 whichever comes first.	Yes/No
10	**Sand feeder (Company Owned and available elsewhere globally)** Minimum on-site capacity requirement = 650,000 lbs proppant that can be pumped in a single job without the need of filling during pumping operations. If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days of signing of contract or upto March 2020 whichever comes first.	Yes/No
11	**Proppant Flow Back Prevention** Availability of Proppant Flow back prevention material adding system	Yes/No
12	**Ball Catcher** It should have the provision to retrieve frac balls from the chamber by closing the isolation valve. Minimum pressure rating should be 15k psi for ball sizes from 1" to 3.5". If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days of signing of contract or upto March 2020 whichever comes first.	Yes/No
13	**Ball launcher** Controlled ball drop mechanism for use in multi stage frac operations. Launcher deploys balls upon command into wellbore during fracturing stages. Ball sizes from 1" to 3.5". Minimum pressure rating should be 15k psi. If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days of signing of contract or upto March 2020 whichever comes first.	Yes/No
14	**Back Up Hydraulic System (Company Owned and available elsewhere globally)** To be used in case of failure of sand delivery system. If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days of signing of contract or upto March 2020 whichever comes first.	Yes/No
15	**Liquid Additive System (Company Owned and available elsewhere globally)** Equipped with flow meter with accuracy up to $\pm$ 1% Pump from the fluid storage container and discharged to the suction of a centrifugal pump, or to the suction of the discharge of the mixer If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days after signing of contract or upto March 2020 whichever comes first.	Yes/No
16	**Fluid Transfer Pumps and Hoses (Company Owned and available elsewhere globally)** If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days of signing after contract or upto March 2020 whichever comes first.	Yes/No
17	**High Pressure Pipping: (Company Owned and available elsewhere globally)** 2" and 3" with minimum 15,000 working pressure If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days after signing of contract or upto March 2020 whichever comes first.	Yes/No
18	**Water Filtration Unit (Company Owned and available elsewhere globally)** Dual cartridge filter skid with ability to filter at least 100 microns or as per requirement. If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days after signing of contract or upto March 2020 whichever comes first.	Yes/No

19	**Tool Basket (Company Owned and available elsewhere globally)** Cross over flange assembly for production well. Frac cross and piping, chiksans for injection and flow back. Any other crossover to hook up equipment to the well head/ Xmas tree. If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days of signing after contract or upto March 2020 whichever comes first.	Yes/No
20	**Annulus Pump (Company Owned and available elsewhere globally)** To assist with pressure differential for burst prevention of tubing If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days after signing of contract or upto March 2020 whichever comes first.	Yes/No
21	**Suction and Discharge Hoses (Company Owned and available elsewhere globally)** If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days after signing of contract or upto March 2020 whichever comes first.	Yes/No
22	**Safety Shower (Company Owned and available elsewhere globally)** If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days after signing of contract or upto March 2020 whichever comes first.	Yes/No
23	**Frac Tree (Company Owned/Third Party and available elsewhere globally)** At least 1 no. quantity each for all sizes having 10K & 15K rating each, (compatible X-mass tree size: 2-9/16"x5K, 3-1/8"x5K, 3-1/16"x10K, 4-1/16"x10K, 3-1/16"x15K, 4-1/16"x15K) If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days after signing of contract or upto March 2020 whichever comes first. In case of third party arrangement please provide valid contract over period of 4 Years	Yes/No
24	**Coil Tubing Services with or without Smart/E-Reel:(Company Owned/Third Party and available elsewhere globally)** • Contractor shall provide coil tubing services along with suitable BHA for milling of copper head bridge plugs. • Smart/E-Coil services with logging head to be utilized for perforation along with OGDCL/Third party perforating guns. • Smart/E-Coil services with logging head for setting of copper head bridge plugs required for zonal isolation. If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days after signing of contract or upto March 2020 whichever comes first. In case of third party arrangement please provide valid contract over a period of 4 Years	Yes/No
25	**15 K Copperhead Drillable bridge and frac. plugs:(Company Owned/Third Party and available elsewhere globally)** Contractor shall provide the 15 K Pressure Rating Copperhead Drillable bridge and frac. Plugs at well site as many as required as per design for 4.5" and 5" casing sizes**.** The contractor shall provide the services of wireline adaptor kit along with crew. If available outside Pakistan than commitment to provide at well site as per design. In case of third party arrangement please provide valid contract over a period of 4 Years.	Yes/No
26	**Abrasive/Abrasi or Equivalent Jetting: (Company Owned/Third Party and available elsewhere globally)** Contractor shall provide Abrasive/Abrasi or Equivalent Jetting pumping services wherever required during frac operation. If available outside Pakistan than commitment to shift to Pakistan maximum of 30 Days after signing of contract or upto March 2020 whichever comes first. In case of third party arrangement please provide valid contract over a period of 4 Years	Yes/No
27	Appropriate lighting during Rig/Rigless operations for frac operations along with power source/generator for this purpose.	Yes/No

28	Availability of cross over for any job in line with well head connection & pumping equipment.	Yes/No

12. DESIGN AND MODELLING CAPABILITIES

Sr.	Description	Availability
1	Software Capabilities to Perform Fracturing and Stimulation Treatment Design.	Yes/No
2	Software Capabilities to Model Post Treatment Response.	Yes/No
3	Software Capabilities to Simulate Treatment Implementation.	Yes/No
4	Software Capabilities for Evaluating & Testing Data for MiniFRAC.	Yes/No
5	Software Capabilities for Post-Frac treatment evaluation.	Yes/No

13. COMPANY PROFILE

Sr.	Description	Availability
1	Registered company inside or outside Pakistan with minimum registration period of 05 years. Provide documents for registration.	Yes/No
2	**Bidder's History (attach proof)** Providing the Hydraulic and Acid Fracturing Services for Five (05) or more years in Pakistan or elsewhere around the globe.	Yes/No
3	**Bidder's experience (attach proof)** Performed at least the following number of jobs in Pakistan or elsewhere around the globe during last 5 years (attach tabulated list with Client Name, brief job details, Date, Location etc.). Proppant Fracturing: 100 jobs Acid Fracturing: 100 jobs Performed pre frac job design: 100 jobs Performed post frac job evaluation: 100 jobs Drillable bridge and frac. Plugs: 10 Jobs	Yes/No
4	**Fully Operational Base in Pakistan** *(liable to inspection by OGDCL)* Contractor to have fully operation base in Pakistan. In case the contractor has no permanent establish base in Pakistan then they have to establish the same maximum of 30 days after signing of contract or upto March 2020 whichever comes first.	Yes/No
5	**3D MEM Capability (Software and Expertise)**	Yes/No
6	**Diversion Technique to stimulate multiple clusters or large intervals**	Yes/No
7	**Contractor R&D structure** (attach proof, R&D budget allocation in audited financial statements etc.)	Yes/No
8	Bidder to provide standard operating procedure (SOPs) for Hydraulic/Acid Fracturing jobs along with Technical specifications of Pressure Control Equipment (PCE), Frac Equipment Inspection Certifications.	Yes/No
9	Bidder, to provide certified Pressure Control Equipment for standard hydraulic fracturing operations.	Yes/No
10	Equipment should be in good condition and of latest model as per industry standards. Equipment should be accompanied with valid maintenance and inspection certificates (attach with bid). Equipment shall be liable to inspection and final approval by OGDCL.	Yes/No
11	Bidder, to provide free of cost basic and advanced training to two (02) OGDCL Engineers every year during the contract period. Share a structured training program c/w list of courses/certifications and location where training will be performed.	Yes/No

14. PERSONNEL

Sr.	Qualification/Experience of crew members	Availability
1	**Frac Master / Specialist (at least 1 per job)** Graduate Engineer with minimum 07 years of exclusive experience of planning, designing and executing hydraulic/acid fracturing along with relevant training(s) and certified courses etc. He would be responsible of gathering required data from company, designing the job, supervising the pumping operations, arranging chemicals and equipment, managing personnel on location and following the required QHSE standards. **(Attach CV and Training/Certificates)**	Yes/No
2	**Frac Engineer (at least 2 Engineers per job)** Graduate Engineer with minimum 05 years of exclusive experience of executing hydraulic/acid fracture jobs. The Frac Engineer would be responsible for all planning aspects and its execution, working in close coordination with the Frac Master. He would be responsible for providing good and continuous communication between company man/Operation Manager, the driller, the pumping crew, production & reservoir engineer during the job. **(Attach CV and Training/Certificates)**	Yes/No
3	**Blender operator + chief mechanic (at least 5 per job)** Should have at least 7 years of exclusive experience as chief mechanic of the equipment and working as a blender operator. He would be responsible for efficiently handling blending operations on location as per proposed pumping plan. He should be capable to trouble shoot equipment during operations to ensure smooth operations. **(Attach CV and Training/Certificates)**	Yes/No
4	**Frac Tree Engineer** Three years' Technical diploma and at least 7 (Seven) years of exclusive experience with Frac tree installations, servicing, testing and dismantling. **(Attach CV and Training/Certificates)**	Yes/No
5	**Frac Crew** Bidder to provide all other crew to carry out the proposed Fracturing jobs and as appropriate for proposed pumping equipment. Local expertise is preferred. **(Attach CV and Training/Certificates)**	Yes/No

15. QHSE

Sr.	Description	Availability
1	Written and approved HSE and Quality Policy	Yes/No
2	QHSE Management System in line with International Standards available to cater HSE risks. Or Management System not available however, procedures are available to fulfill minimum QHSE requirements (i.e. Risk Assessment, Environmental risks, Emergency Response Procedures waste management etc.) Note: Copies of QHSE Management System procedures to be attached.	Yes/No
3	**QHSE Responsibilities (**CV's to be attached)	
3.1	Dedicated QHSE person available to handle QHSE matters. Please provide Job responsibilities and Quality Inspection Plan identifying 3rd party certificates for lifting equipment involved in job.	Yes/No
3.2	QHSE Responsibilities given to Supervisor in addition to technical job responsibilities	Yes/No
4	**Hazard Identification & Risk Assessment**	
4.1	Hazard Identification & Risk Assessment / Job Hazard Analysis are conducted before start of job and appropriate preventive measures taken to address hazards. Copies of previously conducted similar assessments to be attached	Yes/No

5	**Environmental Aspect Impact Analysis**	
5.1	Environmental Aspect Impact Analysis is carried out before start of job and mitigation measures taken to prevent environmental damage. Copies of previously conducted similar assessments to be attached.	Yes/No
5.2	Use of National Environmental Quality Standards (NEQS) compliant of equipment e.g. generators at site. Recent emission reports (last Two (02) years) of equipment / vehicles through accredited environmental Lab. to be attached.	Yes/No
6	**Equipment & Tools**	
6.1	Maintenance records of all equipment / tools available	Yes/No
6.2	Third party validity certificates of equipment / tools available	Yes/No
7	**Waste Management**	
7.1	Procedures available for Environment Friendly Waste Disposal for hazardous and non-hazardous waste available. Please provide copy.	Yes/No
7.2	Contractor shall arrange for environment friendly disposal of waste produced as result of its activities.	Yes/No
8	**Emergency Response Procedure**	
8.1	Approved Emergency Response Plan available with responsibilities shall be shared with OGDCL	Yes/No
8.2	All types of required emergency handling equipment is available which include but not limited to appropriate number of fire extinguishers, first aid boxes, stretcher, SCBA, eye wash stations and multi-gas detectors. Please provide details of equipment.	Yes/No
9	**Incident Reporting**	
9.1	Incident Reporting Procedure available	Yes/No
9.2	Contractor shall report all incidents and dangerous occurrences to Company's Site Representative, concerned Government Authorities, CIM, District Management etc. as per legal and regulatory requirement.	Yes/No
10	**Project QHSE Performance Report**	
10.1	Contractor to submit Project QHSE performance report / statistics to OGDCL Site Representative at the end of project.	Yes/No
11	**HSE Legal / Regulatory Compliance.**	
11.1	Contractor shall comply with Health & Safety Regulations Mines Act 1923, The Oil & Gas (Safety In Drilling & Production Regulations 1974)	Yes/No
11.2	Contractor shall comply with Environmental Protection ACT 1997 and National Environmental Quality Standards	Yes/No
12	**QHSE Trainings**	
12.1	All staff is trained is in basic QHSE trainings i.e. Fire Fighting, First aid, H_2S. Please provide details / records of the crew.	Yes/No
12.2	Staff receives specialized QHSE trainings with respect to their jobs	Yes/No
13	**Personal Protective Equipment**	
13.1	All required personal protective equipment available to all its staff and subcontractors.	Yes/No
14	**Permit to work**	
14.2	PTW system available and strictly followed	Yes/No
15	**Vehicle Management**	
15.1	Travelling Policy / Procedure available	Yes/No
15.2	Cranes, Fork lifters are third party certified. Certificates to be provided before the execution of job.	Yes/No

FORMAT FOR RATES

DESIGN OPTIMIZATION/FRAC FEASIBILITY STUDY			
Sr.	Description	UOM (U)	Unit Rate (US$/UOM)
1	Design Optimization for Shale Frac	Well	

BREAK DOWN INJECTION(BDI)/CALIBRATION INJECTION (CI)				
Sr.	Description	UOM (U)	Unit Rate (US$/UOM)	
			Operating	Standby
1	Break Down Injection (BDI)-Equipment-standby	Day	N/A	
2	Calibration Injection (CI)-Equipment-standby	Day	N/A	
3	Break Down Injection (BDI)-Crew	Day		
4	Calibration Injection (CI)-Crew	Day		
5	Corrosive/abrasive fluids Volume pumping charges for BDI	BBL		
6	Non Corrosive fluids Volume pumping charges for BDI	BBL		
7	Corrosive/abrasive fluids volume pumping charges for CI	BBL		
8	Non Corrosive fluids volume pumping charges for CI	BBL		
9	Break Down Injection (BDI)-Equipment Mob/De-mob	KM		
10	Calibration Injection (CI)-Equipment Mob/De-mob	KM		
11	Break Down Injection (BDI)-Crew Mob/De-mob	KM		
12	Calibration Injection (CI)-Crew Mob/De-mob	KM		

MAIN FRAC TREATMENT(MFT)				
Sr.	Description	UOM (U)	Unit Rate (US$/UOM)	
			Operating	Standby
1	MFT (Based on 8 pumps,15kpsi, 16,000HHP)-standby	Day	N/A	
2	Extra Pump, 15kpsi, 2,000 HHP-standby	Day	N/A	
3	MFT crew (Based on 8 pumps,15kpsi, 16,000HHP)	Day		
4	Extra Pump Crew, 15kpsi, 2,000 HHP	Day		
5	Corrosive/abrasive fluids volume pumping charges for MFT (16,000 HP)	BBL		
6	Non-Corrosive volume pumping charges for MFT (16,000 HP)	BBL		
7	Extra Pump (2,000 HP) Corrosive/abrasive fluids volume pumping charges.	BBL		
8	Extra Pump (2,000 HP) Non-Corrosive volume pumping charges	BBL		
9	MFT (Based on 8 pumps,15kpsi, 16,000HHP) equipment Mob/De-mob	KM		
10	MFT (Based on 8 pumps,15kpsi, 16,000HHP) Crew Mob/De-mob	KM		
11	Extra Pump, 15kpsi, 2,000 HHP Mob/De-mob	KM		
12	Extra Pump Crew, 15kpsi, 2,000 HHP Mob/De-mob	KM		

Note: Extra Pump charges wherever stated means inclusive of all associated tanks, connection etc.

CRANE/ FORK LIFTER/FRAC TREE				
Sr.	Description	UOM (U)	Unit Rate (US$/UOM)	
			Operating	Standby
1	Frac Tree 15kpsi	Day		
2	Frac Tree 15kpsi- Crew	Day		
3	Crane (50 ton) with Operator	Day		
4	Fork lifter (5 ton) with Operator	Day		
5	Frac Tree 15kpsi Mob/De-mob.	KM		
6	Frac Tree 15kpsi Crew Mob/De-mob	KM		
7	Crane (50 ton) with Operator Mob/De-mob	KM		
8	Fork lifter (5 ton) with Operator Mob/De-mob	KM		

COIL TUBING & PUMPING SERVICES				
Sr.	Description	UOM (U)	Unit Rate (US$/UOM)	
			Operating	Standby
1	Coil Tubing Unit with 1.5" -2" coil (Complete Set up)	Day		
2	CT BHA for milling and circulating out of Copper Head Plugs	Day		
3	Smart/E-coil with logging head	Day		
4	Pumping Crew	Day		
5	Coil tubing crew	Day		
6	Smart/E-Coil Crew	Day		
7	Pumping Equipment Complete with 2,000 HHP pumping unit with back up, tanks and hook up connections- Standby	Day	N/A	
8	Abrasive/Abrasi or equivalent Pumping services including Mob/De-mob	Station		
9	Coil Tubing Cumulative Depth Charges	Meter		
10	Coil Tubing with Smart/E-Coil Cumulative Depth Charges	Meter		
11	Pumping volume charges with 2,000 HHP pumping unit	BBL		
12	Coil tubing unit Mob/De-mob	KM		
13	Coil tubing Crew Mod/De-Mob	KM		
14	Smart/E-coil with logging head Mob/De-mob	KM		
15	Smart/E-Coil crew Mob/De-mob	KM		
16	Pumping Crew Mob/De-mob	KM		
17	Pumping Equipment Complete with 2,000 HHP pumping unit with back up, tanks and hook up connections- Mob/De-mob charges	KM		

Note: CT/Smart or E-Coil operation includes plug setting, perforation, sand plug cleaning, fishing, copper head plug milling and circulating out.

COPPERHEAD DRILLABLE BRIDGE AND FRAC PLUGS			
Sr.	Description	UOM (U)	Unit Rate (US$/UOM)
1	Copperhead Drillable bridge and frac Plugs (At Field Location)	Nos.	
2	Crew with wireline adaptor kit operating	Day	
3	Crew with wireline adaptor kit standby	Day	
4	Crew with wireline adaptor kit Mob/De-mob	KM	

CANCELLATION CHARGES			
Sr.	Description	UOM (U)	Unit Rate (US$/UOM)
1	BDI Cancellation Charges	Nos.	
2	CI Cancellation Charges	Nos.	
3	MFT Cancellation Charges	Nos.	

LABORATORY SERVICES			
Sr.	Description	UOM (U)	Unit Rate (US$/UOM)
1	Frac Fluid Compatibility Testing	Per test	
2	Sand/Proppant Grain Size Testing	Per test	
3	Sand/Proppant Crush Resistance Testing	Per test	
4	X-ray Diffraction Mineralogy Analysis	Per test	
5	Scanning Electron Microscopic Analysis	Per test	
6	Triaxle Core Testing	Per test	
7	Particle Size Distribution & Characterization	Per test	
8	Core Flow Retained Permeability Testing	Per test	
9	Capillary Suction time Test	Per test	
10	Proppant Embedment Test	Per test	

Frac Fluid Recipe upto 320 ^{0}F for Shale						
Sr.	Product Name	Product Code	UOM	Unit Rate /UOM	Qty.	Rate US$
1						
2						
3						
4						
5						
6						
7						
8						
					Recipe cost(US$)/BBL	

Note: Frac fluid recipe should include all the required additives as per formation/reservoir properties and compatibility issues i.e Viscosifier, breaker, breaker aid, cross-linkers, bactericides, anti-foaming/foaming agents, clay stabilizers, surfactants, polymers, Demulsifier, anti-sludge agent, friction reducers, activators, buffers, pH-stabilizers, temperature stabilizers. etc.

Acid Fluid (HCl Base) Recipe upto 320 ^{0}F for Shale						
Sr.	Product Name	Product Code	UOM	Unit Rate /UOM	Qty.	Rate US$
1						
2						
3						
4						
5						
6						
7						
8						
					Recipe cost(US$)/BBL	

Note: Acid fluid recipe should include all the required additives as per formation/reservoir properties and compatibility issues with maximum inhibition time and 2,000 PPM iron control i.e HCL, Gelling agent, cross-linkers, chelating agent, corrosion inhibitor, corrosion inhibitor aid, Demulsifier, surfactant, clay stabilizer, H_2S scavengers, H_2S-CO_2 corrosion inhibitor etc.

Slick Water Recipe upto 320 ^{0}F						
Sr.	Product Name	Product Code	UOM	Unit Rate	Qty.	Rate(US$)
1						
2						
3						
4						
					Recipe cost(US$)/ BBL	

Note: Slick water recipe include but not limited to Friction reducers, bactericide, Surfactant, clay stabilizers etc.

Proppant For Shale			
Sr.	Description	UOM (U)	Unit Rate (US$/UOM)
1	Proppant for Shale Frac (All Sizes)	lbs	

Circulation Fluid Recipe upto 320 ^{0}F for Copper Head Bridge Plug Milling						
Sr.	Product Name	Product Code	UOM	Unit Rate /UOM	Qty.	Rate US$
1						
2						
3						
4						
					Recipe cost(US$)/ BBL	

FINANCIAL EVALUATION

TABLE 1: DESIGN OPTIMIZATION/FRAC FEASIBILITY STUDY					
Sr.	Description	Qty. (Q) Nos.	UOM (U)	Unit Rate (P) (US$/Well)	Total R=(P X Q) US$
1	Design Optimization For Shale Frac	2	well		
				Total Cost (US$)	

TABLE 2: BREAK DOWN INJECTION(BDI)/CALIBRATION INJECTION (CI)					
Sr.	Description	Qty. (Q) Nos.	UOM (U)	Unit Rate (P) (US$/UOM)	Total R=(P X Q) US$
1	Break Down Injection (BDI)-Equipment Standby	1	Day		
2	Calibration Injection (CI)-Equipment standby	2	Day		
3	Break Down Injection (BDI)-Crew Operating	1	Day		
4	Break Down Injection (BDI)-Crew Standby	2	Day		
5	Calibration Injection (CI)-Crew Operating	1	Day		
6	Calibration Injection (CI)-Crew Standby	2	Day		
7	Corrosive/abrasive fluids Volume pumping charges for BDI	150	BBL		
8	Non Corrosive fluids Volume pumping charges for BDI	300	BBL		
9	Corrosive/abrasive fluids volume pumping charges for CI	150	BBL		
10	Non Corrosive fluids volume pumping charges for CI	400	BBL		
11	**Cost/Stage**				Sum(R1:R10)
12	**Cost/well (03 Stages/well)**				=3*R11
13	Break Down Injection (BDI)-Equipment Mob/De-mob	2,600	KM		
14	Calibration Injection (CI)-Equipment Mob/De-mob	2,600	KM		
15	Break Down Injection (BDI)-Crew Mob/De-mob	2,600	KM		
16	Calibration Injection (CI)-Crew Mob/De-mob	2,600	KM		
17	**Mob/De-mob cost/well**				**Sum(R13:R16)**
18	**Break Down Injection(BDI)/Calibration Injection (CI) cost/well**				**=R12+R17**
19	**Break Down Injection(BDI)/Calibration Injection (CI) cost for 02 wells**				**=2*R18**

TABLE 3: MAIN FRAC TREATMENT(MFT)					
Sr.	Description	Qty. (Q) Nos.	UOM (U)	Unit Rate (P) (US$/UOM)	Total R=(P X Q) US$
1	MFT (Based on 8 pumps,15kpsi, 16,000 HHP)-Standby	30	Day		
2	Extra Pump, 15kpsi, 2,000 HHP-Standby	30	Day		
3	MFT crew (Based on 8 pumps,15kpsi, 16,000 HHP)-Operating	18	Day		
4	MFT crew (Based on 8 pumps,15kpsi, 16,000 HHP)-Standby	30	Day		
5	Extra Pump Crew, 15kpsi, 2,000 HHP-Operating	18	Day		
6	Extra Pump Crew, 15kpsi, 2,000 HHP-Standby Charges	30	Day		
7	Corrosive/abrasive fluids volume pumping charges for MFT (16,000 HP)	3,000	BBL		
8	Non-Corrosive fluids volume pumping charges for MFT (16,000 HP)	230,000	BBL		
9	Extra Pump Corrosive/abrasive fluids volume pumping charges for MFT (2,000 HP)	3,000	BBL		
10	Extra Pump Non-Corrosive fluids volume pumping charges for MFT (2,000 HP)	230,000	BBL		
11	**Cost/well(20 Stages/Well)**				**=Sum(R1:R10)**
12	MFT (Based on 8 pumps,15kpsi, 16,000 HHP) Equipment Mob/De-mob	2,600	KM		
13	MFT (Based on 8 pumps,15kpsi, 16,000 HHP) Crew Mob/De-mob	2,600	KM		

14	Extra Pump, 15kpsi, 2,000 HHP Mob/De-mob	2,600	KM		
15	Extra Pump Crew, 15kpsi, 2,000 HHP Mob/De-mob	2,600	KM		
16	**Mob/De-mob Cost /well**				**=Sum(R12:R15)**
17	**MFT Cost/well**				**=R11+R16**
18	**MFT Cost for 02 wells**				**=2*R17**

TABLE 4: CRANE/ FORK LIFTER/FRAC TREE

Sr.	Description	Qty. (Q) Nos.	UOM (U)	Unit Rate (P) (US$/UOM)	Total R=(P X Q) US$
1	Frac Tree 15kpsi -Operating	18	Day		
2	Frac Tree 15kpsi-Standby	30	Day		
3	Frac Tree 15kpsi- Crew -Operating	18	Day		
4	Frac Tree 15kpsi- Crew-Standby	30	Day		
5	Crane (50 ton) with Operator- Operating	18	Day		
6	Crane (50 ton) with Operator- Standby	30	Day		
7	Fork lifter (5 ton) with Operator-Operating	18	Day		
8	Fork lifter (5 ton) with Operator-Standby	30	Day		
9	**Cost/Well (04 Stages Per Well)**				**=Sum (R1:R8)**
10	Frac Tree 15kpsi Mob/De-mob	2,600	KM		
11	Frac Tree 15kpsi Crew Mob/De-mob	2,600	KM		
12	Crane (50 ton) with Operator Mob/De-mob	2,600	KM		
13	Fork lifter (5 ton) with Operator Mob/De-mob	2,600	KM		
14	**Mob/De-mob Cost per well**				**Sum (R10:R13)**
15	**Total Cost/ Well**				**= R9+R14**
16	**Total Cost for 02 Wells**				**= 2 * R15**

TABLE: 5 COIL TUBING(1.5”-2”) & PUMPING SERVICES

Sr.	Description	Qty. (Q) Nos.	UOM (U)	Unit Rate (P) (US$/UOM)	Total R=(P X Q) US$
1	Coil Tubing Unit (Complete Set up)-Operating	8	Day		
2	Coil Tubing Unit (Complete Set up)-Standby	4	Day		
3	CT BHA for milling of Copper Head Plugs-operating	8	Day		
4	CT BHA for milling of Copper Head Plugs-Standby	4	Day		
5	Smart/E-coil Reel with logging head-Operating	8	Day		
6	Smart/E-coil Reel with logging head-Standby	4	Day		
7	Pumping Crew Operating	8	Day		
8	Pumping Crew standby	4	Day		
9	Coil Tubing crew Operating	8	Day		
10	Coil Tubing crew Standby	4	Day		
11	Smart/E-Coil Crew Operating	8	Day		
12	Smart/E-Coil Crew Standby	4	Day		
13	Pumping Equipment Complete with 2,000 HHP pumping unit with back up, tanks and hook up connections- Standby	4	Day		
14	Abrasi/Abrasive or equivalent Pumping services including Mob/De-mob	10	Station		
15	Coil Tubing Cumulative Depth Charges	8,000	Meter		
16	Coil Tubing with Smart/E-Coil Cumulative Depth Charges	32,000	Meter		
17	Pumping volume charges	1,000	BBLS		
18	Coil tubing unit Mob/De-mob	2,600	KM		
19	Coil tubing Crew Mob/De-mob	2,600	KM		
20	Smart/E-coil with logging head Mob/De-mob	2,600	KM		

21	Smart/E-Coil crew Mob/De-mob	2,600	KM		
22	Pumping Crew Mob/De-mob	2,600	KM		
23	Pumping Equipment Complete with 2,000 HP pumping unit with back up, tanks and hook up connections- Mob/De-mob charges	2,600	KM		
24	**Total cost/Well**				**Sum(R1:R23)**
25	**Total cost for 2 Wells**				**=2*R24**

TABLE 6: 15 K COPPERHEAD DRILLABLE BRIDGE AND FRAC PLUGS WITH SERVICES

Sr.	Description	Qty. (Q)	UOM (U)	Unit Rate (P) (US$/Day)	Total R=(P X Q) US$
1	Copperhead Drillable bridge and frac Plugs (At Field Location)	20	Nos.		
2	Crew with wireline adaptor kit operating	5	Day		
3	Crew with wireline adaptor kit standby	5	Day		
4	Crew with wireline adaptor kit Mob/De-mob.	2,600	KM		
5	**Total Cost Per well (US$)**				**=Sum(R1:R4)**
6	**Total Cost for 02 Wells (US$)**				= 2*** R5**

TABLE 7: CANCELLATION CHARGES

Sr.	Description	Qty. (Q)	UOM (U)	Unit Rate (P) (US$/UOM)	Total R=(P X Q) US$
1	BDI Cancellation Charge	2	Nos.		
2	CI Cancellation Charge	2	Nos.		
3	MFT Cancellation Charge	2	Nos.		
4	**Total Cost (US$)**				**=Sum(R1:R3)**

TABLE 8: LABORATORY SERVICES

Sr.	Description	Qty. (Q)	UOM (U)	Unit Rate (P) (US$/UOM)	Total R=(P X Q) US$
1	Frac Fluid Compatibility Testing	400	Per test		
2	Sand/Proppant Grain Size Testing	400	Per test		
3	Sand/Proppant Crush Resistance Testing	200	Per test		
4	X-ray Diffraction Mineralogy Analysis	400	Per test		
5	Scanning Electron Microscopic Analysis	400	Per test		
6	Triaxle Core Testing	140	Per test		
7	Particle Size Distribution & Characterization	65	Per test		
8	Core Flow Retained Permeability Testing	65	Per test		
9	Capillary Suction time Test	400	Per test		
10	Proppant Embedment Test	140	Per test		
11	**Total Cost for 2 wells**				**=Sum(R1:R10)**

TABLE 9: MATERIALS FOR SHALE FRAC

Sr.	Material Description	Qty. (Q)	UOM (U)	Unit Rate (P) (US$/UOM)	Total R=(P X Q) US$
1	Frac Fluid up to 320 ^{0}F	4,500	BBL		
2	Acid Fluid up to 320 ^{0}F	120	BBL		
3	Slick Water up to 320 ^{0}F	9,000	BBL		
4	Proppant For Shale Frac (All Sizes)	400,000	Lbs.		
5	**Cost/Stage**				**=sum(R1:R4)**
6	**Cost Per Well(20 Stages/Well)**				**=20*R5**
7	Circulation Fluid	600	BBL		
8	**Material Cost Per well**				**=R6+R7**
9	**Material Cost for 02 wells**				**= 2* R8**

TOTAL BIDDING VALUE OF PRICING TABLES			
Sr.	**Table #**	**Service Description**	**Table Totalizer (R)**
1	Table-1	Design Optimization/Frac Feasibility Study	
2	Table-2	Break Down Injection(BDI)/Calibration Injection (CI)	
3	Table-3	Main Frac Treatment(MFT)	
4	Table-4	Crane/ Fork Lifter/Frac Tree	
5	Table-5	Coil Tubing(1.5”-2”) & Pumping Services	
6	Table-6	15 K Copperhead Drillable Bridge And Frac Plugs With Services	
7	Table-7	Cancellation Charges	
8	Table-8	Laboratory Services	
9	Table-9	Materials For Shale Frac	
10		**Grand Total Cost/Lumpsum Cost (US$)**	**=Sum(R1:R9)**

Note:

- Financial Evaluation shall be carried out on “Grand Total Cost/Lumpsum Cost” basis and contract will be awarded to the financially lowest evaluated bidder.
- Published Price Book shall be used for any additional items not covered in the above tables, subject to approval of OGDCL management. Price Book shall not be the part of Financial Evaluation and Contract.
- Number of wells, Days, Millage, recipes and quantities mentioned are for evaluation purposes only. Payment will be made as per actual.