OIL INDIA LIMITED
DULIAJAN

Advertisement

INVITATION FOR EXPRESSION OF INTEREST (EOI)

Oil India Limited, a Government of India "MAHARATNA" Category Enterprise, engaged in the business of Exploration, Production & Transportation of Crude Oil and Natural Gas and Production of LPG invites EOI against **Invitation for EOI No. FB:EOI/T/1023/2023 dated 23.09.2023 from interested service providers for HIRING OF BUNDLED SERVICES (CEMENTING AND MUD ENGINEERING SERVICES) FOR 02 (TWO) YEARS (WITH PROVISION FOR 1-YEAR EXTENSION) FOR DRILLING AND WORKOVER JOBS IN TULAMARA DSF BLOCK, TRIPURA.**

Interested Parties having relevant experience and expertise (requirement details are available at OIL's website-www.oil-india.com) are invited to submit their EOI(s) at our e-mail-id: frontierbasin@oilindia.in within the stipulated date as indicated in the detailed EOI. The offer(s) may also be uploaded in Parties' Cloud based shared drive/ FTP server/File sharing website (portal) and the link(s) may be provided to us at our e-mail within above specified period. All Corrigenda, addenda, amendments, time extensions to the EOI will be hosted on the website and no separate notification shall be issued in the press. Prospective participants against the EOIs are requested to visit the website regularly to keep themselves updated.

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INVITATION FOR EXPRESSION OF INTEREST NO. No. FB:EOI/T/1023/2023 for HIRING OF BUNDLED SERVICES (CEMENTING AND MUD ENGINEERING SERVICES) FOR 02 (TWO) YEARS (WITH PROVISION FOR 1-YEAR EXTENSION) FOR DRILLING AND WORKOVER JOBS IN TULAMARA DSF BLOCK, TRIPURA.

1. INTRODUCTION

OIL INDIA LIMITED (OIL), a Government of India Enterprise, is a premier Oil & Gas Company engaged in exploration, production and transportation of hydrocarbon with its headquarter at Duliajan in Dibrugarh district of Assam, India. The company has been awarded Tulamara DSF block (Block: AA/ONDSF/TULAMARA/2018) located near to the Karbook Sub-division of Gomati District and Santirbazar and Sabroom Sub-divisions of South Tripura District in Tripura and covers an area of 47.23 sq. km.

OIL invites **Expression of Interest (EOI)** from interested and reputed Service Providers with relevant experience and expertise for carrying out various works associated with the HIRING OF BUNDLED SERVICES (CEMENTING AND MUD ENGINEERING SERVICES) FOR 02 (TWO) YEARS (WITH PROVISION FOR 1-YEAR EXTENSION) FOR DRILLING AND WORKOVER JOBS IN TULAMARA DSF BLOCK, TRIPURA.

Note: Service Providers(s) having their own in-house services are qualified to participate. Any submission through agents or sub-contractors or intermediates will not be acceptable.

2. OBJECTIVE

Following services are included in the requirement of Bundled Services for Drilling and Workover Jobs:

a) Cementing Service with Unit/s, Tools/Equipment including slurry design, supply of API class G cement, additives along with Cementing personnel.

b) Mud Engineering Service including supply of mud chemicals, laboratory services along with Mud Engineers.

Accordingly, this Invitation to EOI has been floated for seeking expression of interest (EOI) from suitably experienced Service Providers for providing Bundled Services as mentioned above with an aim to firm up the Scope of Work including BEC/BRC for the tender to be floated towards hiring of the services in near future. Hence, this is an invitation of technical proposals from potential vendors and to hold pre-tender technical discussions with interested parties, if required, without

any commitments on tendering or award of contract.

3. LOCATION OF THE AREA OF WORK

The area of the operation as planned is in Gomati and South Tripura districts in the State of Tripura near the Bangladesh Border. The block Tulamara DSF is approximately 120 KM from state capital, Agartala in the north-eastern state of Tripura. However, if the need arises, OIL may consider engaging these services (whole or part) in other parts of NE states operated by the company with mutually agreed rates and terms & conditions.

4. BROAD SCOPE OF WORK AND MOBILIZATION PERIOD

4.1 Scope of work under this EOI broadly encompasses the following jobs:

a) **Cementing Service** with Unit/s, Tools/Equipment including slurry design, supply of API class G cement, additives along with Cementing personnel.

b) **Mud Engineering Service** including supply of mud chemicals, laboratory services along with Mud Engineers.

4.2 **MOBILIZATION PERIOD**: Mobilization of all the services along with materials and manpower are to be completed **within 90 (ninety) days** from the date of issue of mobilization Notice

4.3 **DURATION OF CONTRACT**: The contract period shall be initially for 02 (two) years with a provision for 1-year extension.

5. SERVICE PROVIDERS' PRE-QUALIFICATION CRITERIA

The interested parties must fulfil the following minimum qualifying criterion:

5.1 EXPERIENCE: Should have experience of successfully providing "Cementing Service" & "Mud Engineering Service" with men and material for a minimum of 5 (five) onshore wells (for well depth more than 3500m) to reputed E&P companies in last 5 (five) years to be reckoned from the date of publication of the EOI. E&P Company means companies involved in the exploration & Production of Crude Oil & Natural Gas.

5.2 Interested parties are requested, as a minimum, to submit the following documents and details:

(i) **Company information as under:**

a. Name of the Contractor/Service Provider.

b. Address, Phone, E-mail of the Contractor/Service Provider

c. If a Joint Venture/Consortium is proposed, Name, Address, Phone, E-mail of all Joint Venture partners/consortium members.

d. Bidder's general structure and organization, including the branch / sub-division dedicated to such activities.

(ii) **Supporting documents for experience:**

a. Supporting experience document as per the PRE-QUALIFICATION CRITERIA towards providing service to any E&P companies through one single contract or separate contracts in the last 5 (Five) years reckoned from the publication of this EOI.

b. The Bidder should submit copies of respective contracts, along with documentary evidence in respect of satisfactory execution of each of those contracts, in the form of copies of any of the documents (indicating respective contract number and type of services), such as –

(i) Satisfactory completion / performance report (OR)
(ii) proof of release of Performance Security after completion of the contract (OR)
(iii) proof of settlement / release of final payment against the contract (OR)
(iv) any other documentary evidence that can substantiate the satisfactory execution of each of the contracts cited above.

Note: Any ongoing contract, as on the date of publication of EOI shall also be considered, if the required experience is met and to this effect, satisfactory performance certificate from the concerned user is enclosed.

5.3 Should indicate on what capacity the Contractor/Service Provider wants to submit their EOI i.e. either as single entity, JV, Consortium etc.

6. General Terms & Conditions

(i) Interested Contractor/Service Provider must provide the acceptance of the Draft Scope of Work and Schedule of Rates **(enclosed as Annexure-A and Annexure-B**) OR may suggest minor modifications to the same. with clearly indicating the EOI number and EOI Description on their EOI response. OIL INDIA LIMITED (OIL) reserves the right to ignore any or all EOIs and also to curtail/ enhance the scope of work stated above, if required, without assigning any reason thereof.

(ii) All documents submitted with the EOI must be self-certified by the Contractor/Service Provider's authorized person.

(iii) All the copies of document submitted along with the EOI should be clear and legible.

(iv) Service Provider should clearly mention (point wise) whether they satisfy the above criteria & support it with necessary documentary evidence.

(v) Any additional services deemed necessary for the project, should be proposed by the interested Service provider / Contractor and included in the proposal. OIL INDIA LIMITED (OIL) reserves the right to ignore any or all EOIs and also to curtail/ enhance the scope of work stated above, if required, without assigning any reason thereof.

(vi) OIL INDIA LIMITED (OIL) reserves the right to physically check the original documents/certificates, copies of which are submitted along with the EOI.

(vii) OIL INDIA LIMITED (OIL) reserves the right to terminate the EOI process at any point of time without assigning reason.

(viii) OIL is neither committed nor obliged to include any contractor on the tender list or award any form of contract to any bidder and/or associated companies.

(ix) The EOI is liable to be ignored in case of submission of any misleading/false representation by the Contractor/Service Provider in the form of statements and attachments.

(x) This Invitation to EOI is non-binding in nature and submission of information should not be considered as shortlisting/ selection for company in any subsequent RFP/ Tender/ Bid process that may be undertaken in future.

(xi) No participant shall contact OIL on any matter relating to the EOI after the last date of submission of EOI unless requested for so in writing. Any effort by the bidder to influence OIL in the decision making in respect of EOI will result in the rejection of that bidder.

(xii) Based on the responses received against this invitation, a virtual meeting/ offline discussion (as per convenience of OIL and if required) may be held with the responding service provider/ contractor/ vendor/ company to discuss on the information/ views submitted. Date and time shall be intimated separately.

(xiii) Draft scope of work (SOW) along with draft Schedule of Rates (SOR) for both the services is enclosed as **Annexure-A and Annexure-B** along with this EOI.

Note: This is not an invitation to tender.

7. SUBMISSION OF EOI:

a. The interested parties shall submit the EOI in the following format with details:

EOI No. No. FB:EOI/T/1023/2023

Description: EOI for "HIRING OF BUNDLED SERVICES (CEMENTING AND MUD ENGINEERING SERVICES) FOR 02 (TWO) YEARS (WITH PROVISION FOR 1-YEAR EXTENSION) FOR DRILLING AND WORKOVER JOBS IN TULAMARA DSF BLOCK."

Experience of the firm:

A. Name of the party:
B. Contact details:
C. Specific experience relevant to required capabilities:

Sl. No.	Client Name with Address	Contract Reference and details	BIDDER / CONSORTIUM member involved in the project (with roles and responsibilities, as applicable)	Technical capabilities deployed (as per scope)	Date of Start	Date of Completion	Contract Value

b. Interested parties meeting the pre-qualifying criteria as above are invited to submit their EOI vide e-mail at our e-mail id: frontierbasin@oilindia.in within **29.09.2023 up to 11:00 Hrs (IST)** with the subject as **EOI for "HIRING OF BUNDLED SERVICES (CEMENTING AND MUD ENGINEERING SERVICES) FOR 02 (TWO) YEARS (WITH PROVISION FOR 1-YEAR EXTENSION) FOR DRILLING AND WORKOVER JOBS IN TULAMARA DSF BLOCK."**

c. The offer(s) should have clear indication whether the same meet the Pre-qualifying criteria.

d. OIL reserves the right to (a) accept or reject any / all offers submitted by parties (b) cancel the process at any time without any liability and assigning any

reason thereof.

8. For clarifications, if any, the interested party may contact the following email addresses:

a. gautam_baruah@oilindia.in
b. suvam.patowary@oilindia.in

Date: 23.09.2023

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Annexure-A

CEMENTING SERVICES UNDER EOI FOR "HIRING OF BUNDLED SERVICES (CEMENTING AND MUD ENGINEERING SERVICES) FOR 02 (TWO) YEARS (WITH PROVISION FOR 1-YEAR EXTENSION) FOR DRILLING AND WORKOVER JOBS IN TULAMARA DSF BLOCK."

A. TERMS OF REFERENCE & TECHNICAL SPECIFICATIONS OF CEMENTING SERVICE:

1. The Contractor shall provide the complete range of cementing services by providing their Engineers, Operators, Technology, cementing unit, other related items, Cement, Cement Additives, consumables, Slurry Design, Spacer design and Spacer chemicals, pre-flush chemicals etc. as detailed below:

The Scope of work will include but is not limited to:

1.1 The BIDDER under this contract shall provide Cementing Engineering Services required for the following types of wells (gas/oil) for cementing along with cementing unit, personnel, cement & cement additives.

A. Vertical wells,
B. J-bend wells,
C. S-bend well,
D. Horizontal well (liner cementing jobs)

1.2 The BIDDER shall be responsible to plan, design of cement slurry, pre-flush (if any), spacer and pumping rate etc. & execute the cement job as per the well requirement, with their own chemicals & additives and to execute the jobs as per the plan approved by the Company with an objective to provide quality cementation job. The "API class G oil well cement" shall be provided by bidder. Displacement of cement slurry will preferably be carried out by Rig pumps. However, depending upon the limitations of rig equipment, at times, services of cementing unit may be utilized for displacement.

Note: BIDDER shall adhere to the tentative cementing program and slurry design as submitted with bid document.

1.3 The BIDDER has to supply the whole package of cement additives from a single source either directly or through tie-up from any one of the following four internationally reputed cement additive supply companies:

1) M/s. Halliburton
2) M/s. BJ Services
3) M/s. Schlumberger
4) M/s. Weatherford

1.4 The BIDDER to carry out relevant tests on cement and additives in the laboratory prior to every job as per the API recommendations as well as actual simulations for cement slurry design.

1.5 The BIDDER shall also be responsible to carryout post job analysis of all critical cementation jobs in their simulator and to suggest ways and means to improve further quality of jobs.

1.6 The BIDDER shall take into account the availability of all the requisite equipment, cement and additives for the cementation jobs at the planning stage. The BIDDERs shall co-ordinate and recommend the availability of additives for all critical jobs prior to commencement.

1.7 The BIDDER shall use the cement in stock (for use at well site) to test slurry design in their own labs to confirm the designed slurry parameters.

1.8 The BIDDER to collect water samples from rig and to test in their own labs to confirm the designed slurry parameters.

1.9 The BIDDER shall design and carry out the following Cement jobs, Cement squeeze jobs or any other pressure pumping jobs as per the well requirement.

A- Primary cementing job (oil/gas well)
B- Two stage cementing jobs.
C- Liner cementation job.
D- Casing Integrity test/Casing Hermetical testing, if required.
E- Isolation repair job, if required.
F- Secondary cementing (Plug & squeeze Job)
G- Leak of test with the pumper
H- Any other cementing job that may be necessary to be carried out by the cementing equipment/unit (Open hole plug for sidetrack etc.).

1.10 The Cementing Engineer should propose tentative cementing program before time and make real-time changes as per the drilling requirement of the company.

1.11 Quality packaging of chemicals/additives should be according to the relevant API and OCMA specifications. The BIDDER should provide a list of complying standards.

1.12 The BIDDER must have a complete cement slurry design & testing laboratory in India for carrying out necessary lab tests as per the testing condition and cement slurry properties given in Annexure -I.

The cement program shall include but not be limited to the following:

a) Cement slurry density and volume
b) Cement slurry formulation & consistency
c) Draft hydraulic simulation.
d) Draft computational fluid dynamics for fluids compatibility, interaction and optimization of properties and volumes.
e) Bottom hole circulating temperature simulations.
f) Propose cement additive and recommended concentration for the hole section.
g) Complete cost estimates.
h) API fluid loss at 1000 psi and BHT using Stirring Fluid Loss as per API recommendation for temperature > 190F (Static & Dynamic) (, if any).
i) Thickening time as per API schedule, Free water as per API schedule, Comprehensive strength at BHT (24 hrs & 72 hrs as per API schedule)
j) For all Gas tight slurries in order to confirm gas tight integrity of cement slurry,

bidder has to submit static gel strength test reports using Static Gel Strength (SGS) analyzer (recommended in API) indicating transition time maximum 45 min from 100 lbf/100ft2 to 500 lbf/100ft2.

k) For gas tight slurry. The bidder has to submit the "No gas migration test certificate" along with necessary test report with of their own. SGSA report is acceptable.

l) API class G schedule test (1 time for every new lot of API class G cement received at site/bulk handling plant facility for use at well site).

1.13 The BIDDER shall maintain the log of operations to include cementing operation in progress, time break-up, density measurement, mixing rate, volume of fluid pumped, pumping pressure during cement pumping & displacement, displacement rate, quantity of cement, additives & mechanical aids used. All specific events occurring throughout the cementation job should be recorded along with other relevant points for post job analysis.

1.14 The BIDDER shall be responsible for providing a complete job report comprising of slurry design, computer aided program, job execution parameter, complications if any, complete post job analysis & material consumption report so that accordingly necessary corrective measures/ improvements/precautions for future operations may be taken up so to avoid costly secondary repair jobs. The BIDDER shall also familiarize operator personnel with complete understanding of software program to have meaningful interpretation of data.

1.15 BIDDER shall provide all equipment including cementing unit, manpower materials, chemicals and services specified herein. BIDDER shall be solely responsible for the operation and maintenance of BIDDER'S equipment to avoid downtime including but not limited to the rigging up, testing, running, and rigging down thereof.

1.16 BIDDER should conduct Quarterly Service Meeting for evaluating the following:

a) Job volume and post cement job analysis
b) Highlights of the cement jobs performed
c) Modern Technologies
d) Job Performance based on CBL-VDL.
e) Financial implications in terms of Cost of Additives/bbl of slurry.

1.15 BIDDER shall provide centralizer placement plan to OIL's representative for effective cementation based on actual caliper log report using cementing simulation software prior to casing running in operation.

2.0 DETAILS OF EQUIPMENT TO BE DEPLOYED BY THE BIDDER:

BIDDER shall provide all equipment necessary to carry out the jobs specified in the Scope of Work above and described elsewhere herein. The list of equipment and materials may contain such backups that may be necessary to avoid disruptions. A brief description of the set up may be as follows:

2.1 CEMENTING UNIT: 1 no.

SPECIFICATIONS:

The cementing unit should be a twin pump high pressure-pumping unit suitable for all types of pressure pumping services including but not limited to cementing. The unit should be mobile, self-driven or trailer mounted with standby horse unit having self-contained centrifugal supercharger pumps, circulating mixing system, hoppers, and feed water pump etc.

The cementing unit should be complete in all respect for the cement jobs but not limited to the following:

a) Pump Sets: The twin-pumping unit should be of single acting triplex pumps and at least one pump must have rated capacity of 10,000 PSI WP (Minimum) with pumping rate of 8 to 10 US BBLS per minute. Pumps should have safety valves (reset type) and could be set at any pressure as desired.

b) Prime Mover: The pumping unit should be powered by two diesel engines compatible with the Pump Set rating. The engines should have self-contained system for air or electric start.

c) Re-circulating Cement Mixing System: Re-circulating equipment consisting of re-circulating mixer used in conjunction with a single/two compartment, adequate for the requirement. Mixing tub equipped with a turbine agitator (optional) in each compartment. Re-circulating equipment which uses enhanced high-shearing jet mixing system is also acceptable. Total Cement slurry tank capacity should not be less than 10 us bbl.

d) Displacement Tanks: Twin calibrated displacement tanks graduated in 0.5 bbls increments and holding a maximum of 10 bbls each for a measured total of 20 bbls.

e) Central Control Console: All controls should be centrally located on the operating platform of the unit at a control panel. The controls must include:

- All engine functions and diagnostic gauges for engine parameters (Oil pressure, temperature, transmission temperature and pressure)
- Air actuated controls for all low-pressure valve systems Pump rate gauge for each pump with a totalizer Pressure gauges for each pump.
- Centrifugal hydraulic pressure gauges.
- All safety control system Cement slurry density meter

f) Safety System: The cementing unit must incorporate adequate safety systems to avoid damage to the equipment or personal injury in the case of over pressurization.

g) Full sensor package of advanced technology (without presence of radioactive source/sensor) for monitoring & recording pumping parameters including rate, display and record them so that data can be viewed, recovered, transmitted digitally and both soft & hard copies can be made.

NOTE: The bidder under the service will be required to transmit the cementing operation data including Rig data (If available) through remote monitoring software system to OIL base and the system should be capable to run hydraulics simulations real time.

h) The bidder should provide the printed technical literature/catalogue for the offered cementing unit, tool/ equipment/ consumables etc.

i) The bidder should include one cement surge tank of capacity 60 cft. (approx.) along with cementing unit capable of taking input bulk cement from field storage cement silo/field transport bulk cement silo for smooth operation of cementing unit with provision of pneumatic knife valve for operation.

2.2 BATCH MIXER: 1 no.

a) 100 bbl. Capacity cement batch mixer: 100 bbl. Capacity (2 x 50 bbl. single - twin unit is also acceptable) cement batch mixer: One No. (Trailer/ Truck mounted/Skid Mounted) with re-circulating/ jet mixing system agitator. The batch mixer should be complete with all standard equipment, gadgets, pipe fittings etc. for preparing cement slurries as desired by Company or its Consultant.

b) No Rental Charges shall be paid.

c) Operational Charges shall be paid per job basis as per rate quoted by the bidder against Tender.

d) The Batch mixer will be mobilized by OIL purely as per operational requirement.

e) The bidder shall be responsible for operation & maintaining the Batch Mixer in proper working condition at all the time during the contract period.

2.3 BULK HANDLING EQUIPMENTS:

i) BIDDER/Contractor is required to provide and maintain a bulk handling facility of its own, inclusive of pneumatic silos (total capacity to be based on the job that requires that maximum amount of cement) with all required accessories such as air compressor, cutting bottles, air dryer, dust collector, rock catcher, etc, for screening, blending etc. for quality control of dry/blended cement supplied at well site. All pressure vessel equipment should have pressure gauges and over pressure relief valves. The space, site & HSE for bulk facilities and transfer of cement/ blended cement to wellsite will be exclusive responsibility of contractor. The facility should have capacity to meet the demand of dry blended cement and bulk cement screening requirements for all cement jobs in well.

(ii) BIDDER/Contractor is required to provide one (1) set of vertical field storage silo for Rig site having total capacity of (minimum) 3000 cu.ft. Space of around 40 m^2 will be provided at well site for placing vertical silos to store cement for cementation jobs. BIDDER/Contractor is required to provide Air Compressor to carry out loading and unloading of bulk cement for the above rig site silos. BIDDER/Contractor is responsible for all operations, rig up and rig down of the rig cement silo and all HSE requirements associated with it as per OIL's HSE requirement. However, crane service will be provided by OIL for rig-up and rig down at well site. BIDDER/Contractor is responsible for movement of rig cement silo to next drilling location.

2.4 Mixing (gauging) water tank system:

The BIDDER/contractor is required provide all the all-necessary arrangements for mixing (gauging) water tank system at rig site to prepare mixing water at site to wet blend cement slurry. Two (2) nos. of mix water tanks having total minimum capacity of (377 us bbl) 60 KL with minimum two nos. of top entry agitator per tank, mixing hopper and recirculating system to homogenously mix cement additives in fresh water. The BIDDER/contractor will be responsible to provide, operate, HSE and maintenance of the auxiliary systems like centrifugal pump & manifolds engaged in mixing water tank system. The Bidder/contractor is required to provide all necessary arrangements to supply the mixed fluid from mixing water tank system to cementing unit and cement batch mixer during the cementing job.

OIL will provide required volume of fresh water for mix water preparation. OIL will provide necessary space and crane service for placement of mixing water system at rig site. OIL will not provide any diesel or electrical power to run the above system. BIDDER/Contractor is responsible for movement of mixing water tank system to next drilling location.

Note: The total bottom sump volume (dead volume) in the above tank system should not be more than 10 us bbl.

2.5 SURFACE FITTINGS [TOOLS / EQUIPMENT]:

The BIDDER shall provide all the surface equipment / accessories / spares to carry out the cementing jobs as per the well cementation program and not limited to as under:

a) Cementing head with quick change adaptor:

1. 20” x 94ppf, N-80 & K55 x BTC (API 5CT) single plug cementing head (minimum 1000 PSI) with quick coupler/adaptor having bottom buttress pin thread for 20 inch casing-**1 nos.**
2. 13 3/8” x 68ppf, N-80 & P110 x BTC (API 5CT) Standard double plug cementing head (3000 PSI) with quick coupler/adaptor having bottom buttress
3. pin thread for 13 3/8" casing -**2 nos.**
4. 9 5/8” x 47ppf, N-80 & P110 x BTC (API 5CT) Standard double plug cementing head (5000 PSI) with quick coupler/adaptor having bottom buttress pin thread for 9 5/8" casing -**2 nos**.
5. 7"x 29ppf, N-80 & P110 x BTC (API 5CT) Standard double plug cementing head (5000 PSI) with quick coupler/adaptor having bottom buttress pin thread for 7" casing for 7" casing-**2 nos.**
6. 5"x 20ppf, N-80 & P110 x BTC (API 5CT) Standard double plug cementing head (5000 PSI) with quick coupler/adaptor having bottom buttress pin thread for 5" casing -**2 nos**.
7. Adequate spares for above.

b) Chiksan Loops: 2” chicksan loops of 10-12 ft length each & 15000 psi (fig1502) rating having suitable hammer unions and adapters to connect with the manifold of the cementing head as well as cementing unit- Total length 300 Ft Minimum. Safety restrain for the chiksan is required and will be provided by the service provider.

2.5 Laboratory Services:

BIDDER shall provide a cement slurry design & testing laboratory in India for carrying out necessary lab tests as per the testing condition and cement slurry properties given in Annexure-I during the contract tenure. The bidder is required to equip the Laboratory with requisite equipment necessary to carry out the jobs specified in the Scope of Work above and described elsewhere herein.

A brief description of the laboratory set up with the following minimum equipment should be provided by the bidder:

i. 2 no of HPHT Consistometer to measure Thickening time
ii. 1 no of Ultrasonic Cement Analyzer/other equipment to measure compressive strength.
iii. 1 no of Rotational viscometer to measure rheology of cement slurry
iv. 1 no of fluid loss apparatus to measure fluid loss of cement slurry
v. 1 no of Atmospheric Consistometer
vi. Linear Expansion Testing Kit
vii. Thermostatic water bath

The Bidder should furnish details of the facilities and literatures/catalogues of the various tools & equipment available in the Lab to undertake cement formulation and slurry design covering all parameters along with the techno-commercial bid.

NOTE: Bidders are required to provide technical literature with schematic diagram of major Tools / Equipment / Spares etc. showing all specifications listed in this exhibit.

3.0 PERSONNEL:

The following is the minimum category and number of Personnel required to be provided by the BIDDER for operation. The BIDDER may have more personnel, if considered necessary. However, if the BIDDER deploys more than required personnel for assisting their engineer towards performance of any specific job at well site during the currency of contract, Company will not pay for such additional manpower.

Sl.no.	Personnel	Minimum Qty
1	Cementing Engineer	1 No. for the Project
2	Cementing Operator/Cementer	1No. Per Cementing Unit
3	Cementing Assistant/Helper	2 Nos. Per cementing Unit
4	Cement silo/bulk plant operator	02 nos.
5	Mixing water tank operator	01 no.

A. Experience of Personnel:

CEMENTING SERVICES **Annexure-A**

1. Cementing Engineer

a) The BIDDER will deploy competent, qualified (minimum of a valid degree in bachelors in engineering), adequately experienced and trained cementing Engineer with minimum five (05) years independent experience from the closing date of Tender in HP/DEVIATED/HORIZONTAL WELLS for carrying out jobs as mentioned in scope of work correctly and efficiently.

b) The BIDDER shall depute his Cementing Engineer to supervise all critical cementing jobs at the Rigs.

c) Cementing Engineer should be fully trained in cementing engineering to perform all cementing & testing, analysis & interpretation results of tests and take corrective measures in maintaining required features of cement slurry.

d) The Cementing Engineer deployed should not be more than 50 years of age.

2. Cementing Operator/Cementer

a) Cementing operators/Cementer should have minimum 05 five years of experience as cementing operator and must be able to perform cementing operations independently. The Cementing Operator should have passed at least SSC or equivalent and trade certificate from reputed vocational institute and should also have undergone basic training in Cementing in reputed cementing school, such as Halliburton / Dowell Schlumberger / BJ / IDT (ONGC) or any other reputed cementing school.

b) The Operator should be well conversant with all aspects of cementing and allied pumping jobs. The cementing Operator should have good knowledge about the use of cement additives, their functions and factors influencing slurry design.

c) The Cementing Operator deployed should be agile and of sound health to carry out vigorous operational & maintenance job of cementing unit.

d) The Cementing Operator deployed should not be more than 50 years of age.

e) Operator should be fluent in English language conversation.

3. Cementing Assistant/Helper/ Cement silo/bulk plant operator/ Mixing water tank operator

a) Should have relevant experience of (03) three years.

4. Interview will be conducted by OIL management prior to deployment of all the above-mentioned personnel against the contract in OIL. BIDDER has to submit all required documents prior to start of mobilization.

B. Other requirement

a) The BIDDER shall submit the biodata of personnel proposed to be deployed for services mentioned above (as per attached format) prior to deployment for the service mentioned under the scope of work for OIL's approval.

b) Cementing Engineer & Cementer should be an employee of the BIDDER. Necessary documents in this regard are to be submitted prior to deployment for the organization, necessary documents including appointment letters supporting the previous experience criteria should have to be submitted for approval.

c) BIDDER shall submit an undertaking in the bid stating that they will provide Cementing Engineer & the Contract period.

3.1 Responsibility:

1. Cementing Engineer:

1. The Cementing Engineer should be at base office on continuous 24 hours a day basis.
2. The Cementing Engineer should attend meeting in the office of CGM (Frontier Basin), when called for in connection with the contract.
3. To plan, design, and co-ordinate with Company for successfully carrying out all cementation jobs, technical support for all aspects of cementing, pressure testing and associated cementing units, equipment/tools and shall carry out all connected activities in accordance with the highest standards. He will ensure overall supervision directly by him at site on all cementing/critical jobs.
4. The cementing engineer will co-ordinate with Company Representative in sending cement, well site water and other samples to their cement laboratory as well as OIL's cement laboratory in Duliajan for design of slurry before field operation.
5. At the end of cementation, the Cementing Engineer shall provide/submit report containing the following:
   a) A detailed recap of hole section.
   b) An evaluation of the cement additive properties and their performance.
   c) An analysis and recommendation of the optimum parameters required based on experience gained while drilling the well.
   d) A detailed list of cement additive consumption for the section.
   e) A comparison of planned vs. actual cementing properties for the hole section.
   f) A comparison of planned vs. actual cementing cost in terms of cost of additives/MT of cement slurry.
   g) A detailed study may be performed on all reported cementing problem and methods/ strategies to mitigate them in the future.
   h) A detailed recommendations for future wells.

2. Cementing Operator/Cementer:

The cementing operator / cementer shall be responsible including but not limited to the following:

1. Prepare cement slurry & carry out cementation jobs as per drilling and cement program.
2. Run, maintain, manage the cementing equipment.
3. Prepare regularly cement program and submit to Company Representative on Drilling Unit.
4. Managing stock of inventory related to cementing on the Cementing Unit.
5. Ensure that adequate spares for all the equipment and tools are available on the Cementing Unit
6. Should be well conversant with all aspects of cementing & allied pumping jobs.
7. Shall carry out all the cementing & allied jobs carried out with cementing unit during drilling of oil & gas wells.
8. Provide post job cement report to company representative as per international standards.

3.2 Other Requirements:

1. Personnel provided by the BIDDER must observe all safety and statutory norms applicable to the Company. Their performance must be to the satisfaction of the Company and the BIDDER must be willing and ready to replace, at their own expenses, any of their personnel who are not found suitable by the Company.
2. Before actual deployment of suitable Engineer, the BIDDER must submit the biodata of proposed personnel and obtain clearance from the Company.
3. Provision of PPE (Personal Protective Equipment) for BIDDER'S personal will be the responsibility of the BIDDER.
4. Personnel deployed by the BIDDER should be fluent in English/local language.
5. Bidder should deploy competent personnel to carry out below jobs during the cementation process:
    a) Mixed fluid preparation as per approved cementing plan for the job.
    b) Spacer volume preparation in association with rig personal at chemical mud tank and supervise proper pumping of spacer volume to well as per approved cementing plan for the job.
    c) Supervise proper volume pumping of pre-flush and post-flush volume as per approved cementing plan for the job.
    d) Supervise proper cementing iron line from BIDDER's unit up to well head/cementing head.
    e) Supervise proper use of casing wiper plug (provided by OIL) in the cementing head during cementing operation.
    f) Supervise proper cement slurry preparation (including slurry wt. and volume) and cement slurry volume pumping to the well during cementation as per approved cementing plan for the job.
    g) Supervise proper casing wiper plug release before and after cement slurry pumping as per approved cementing plan for the job.
    h) Supervise proper displacement volume pumping using rig mud pumps (or cementing unit in some special cases), plug bumping and BVP checking as per approved cementing plan for the job.
    i) Supervise and take corrective action to mitigate any abnormal situations during cementation process due to any surface or subsurface anomalies and & complete the cementation process successfully.
    j) Supervise and check the rate of circulation, in/out mud wt., loading of shale shaker by return mud, indication of gas migration, well stability during last well circulation prior to any cementation job and intimate OIL's representative if any corrective action is required prior to start of cementation job.
    k) Supervise and ensure safety of all work personals engage in cementation job to execute accident fee cementation operation.
    l) Supervise and ensure all HSE requirements of OIL are satisfied during cementation job and prevent generation of chemical/lubricant waste during the cementation process. BIDDER's personal are required to clean up any additive or chemical spillage immediately after the job.

3.4 Replacement of BIDDER'S Personnel:

BIDDER shall replace with a suitable substitute within 10 days of getting intimation from Company at BIDDER's expense any of the BIDDER'S personnel if Company so requests in writing setting out grounds for its requirement.

3.4 Short Deployment Rates for Cementing Services Personnel:

In the event of short deployment of personnel while the operation is in progress, deduction will be made with respect to shortage of personnel as under:

Sr. No.	Category	Short Deployment Rates per day (INR)
1	Cementing Engineer	
2	Cementing Operator /Cementer	
3	Cementing Assistant/Helper	

Note: The above Penalty will be deducted as per the above rates or as per the quoted rates by the bidder in the Price Bid Format, whichever is higher against short deployment.

4.0 VINTAGE OF TOOLS / EQUIPMENT:

4.1 The age of the Surface tools and other equipment (except Cementing Unit supplied by the BIDDER shall **not be more than 5 (five) years** old reckoned from techno-in this regard before mobilization. Also, re-certification of the surface equipment and tools from a reputed Third-Party Inspection Agency (pressure tested, thickness test, MPI, QA/QC) are to be provided before mobilization.

4.2 Cementing Unit/Batch mixture shall **not be of more than 10 (Ten) years** old as on the original bid closing date.

4.2 BIDDERs must submit a certificate along with their technical bids confirming the vintage and certifying that all the Equipment/Tools will be deployed in well maintained and perfect working condition.

5.0 QUANTUM OF JOBS TO BE PERFORMED DURING THE CONTRACTUAL PERIOD

The number of jobs anticipated during the initial three years period is as under; however, the actual quantity may vary depending upon the well situation during operations:

Estimated Primary Cementing / Liner cementation jobs (including vertical, horizontal & J bend wells): 17 in 2 (Two) years.

NOTE:

a) Tentative Casing Policy has been furnished above; however, range, casing sizes and depth of various jobs may vary well to well as per the well policy.

b) Two stage cementation job of 9 5/8" casing to be carried out as and when required (Suitable Stage Collars & accessories will be provided by OIL).

c) Quantum of the above indicated jobs are tentative only and may vary to some extent as per OIL's requirements.

6.0 TEHNICAL SUPPORT

The following technical support should be provided as and when required: **This will include but not be limited to:**

a. Testing and analysis of cement & chemical additives in line with API/ISO and other current specifications and provide detailed results of tests, if required.
b. Spacer compatibility, hydraulics and volume optimization simulation is required.
c. Pilot test/ fully test cement slurry properties based on the Well Cementing Programs.
d. Recommend improvements of or to the cement slurry being proposed or used, based on information gained from Company and other parties. This may include suggestions for the use of additional or alternative products (where approved).

Cementing Software to simulate

i. Temperatures to estimate BHCT and BHST.
ii. Mud removal efficiency.
iii. Hydraulic optimization (volume, properties, compatibility).
iv. FEA analysis simulation for the liner jobs or any other proprietary software.
v. Centralizer placement
vi. Casing running-in speed
vii. Gas migration risk analysis

7.0 CONSUMABLES

1. Fresh water for cementing would be provided by OIL. Necessary API class "G" HSR Oil well cement and cement-additives will be provided by the BIDDER/Contractor. Company shall reimburse the cost of such items at actual to the BIDDER/Contractor against submission of documentary evidence on actual consumption basis. However, Diesel for BIDDER's unit, mixed water tank system, air-compressor shall be arranged by the BIDDER/Contractor.
2. The tentative requirements of API Class 'G' HSR Oil well Cement, Cement Additives, casing accessories & well consumables (if any) as assessed by Company are listed below. However, the actual requirement may vary depending upon the hole data nearer the time. The Contractor is required to supply these items (if required) as per actual requirement. Under no circumstance, all the leftover items including Cement/Cement additives and all other additives/ chemicals at the end of contract shall be bought by Company, but the same are to be demobilized by the Contractor at their cost and arrangements. The Contractor is expected to exercise meticulous planning and approach to meet the requirements without affecting operation and quality of the jobs.
3. The contractor shall supply and deliver all required API Class 'G' HSR Oil well Cement (processed through bulk handling plant and ready for use), various cement additives and well consumables (if required) for all kinds of cementation jobs at respective well site. Contractor is also advised to establish a bulk storage and handling facility/main supply base, somewhere nearer to designated well site or other place from where the well site requirements can be fed as and when required in optimum quantity. The Contractor is required to stock sufficient quantity of cement, cement additives and consumables at their nearby supply base/bulk storage facility to meet any eventuality and the stock position must be reviewed and reported to Company Representative at least on weekly basis.
4. Top/ Bottom cement plugs, Centralizer, Scratcher & stop ring as required will be provided by OIL.
5. BIDDER/Contractor shall supply the Cement & Additives in staggered manner depending on well requirement in lots as per OIL's well requirements.

6. BIDDER/Contractor will be solely responsible for all kinds of transport/ logistic requirement's for mobilizing their man, materials and resources.
7. BLENDING, TRANSPORTATION TO WELL SITE ETC:
   Necessary additives will be mixed with gauging water (wet blending) by BIDDER's personals as per their design. Required cement additives for gauging water and pre-flush will be supplied by the BIDDER. Mixed Water tank setup and mixing arrangement will be provided by the BIDDER. Necessary arrangement to feed mixed water to BIDDER's unit will be supplied and managed by BIDDER. Necessary feed to cementing hopper/surge tank will be done by BIDDER's personal through their own pneumatic arrangement. Loading and unloading of bulk cement to field storage silo at site will be done by BIDDER's personal through their own pneumatic arrangement.

8. **CEMENT**, **CEMENT ADDITIVES & CHEMICALS**

8.1 BIDDER will design the required slurry with the quoted chemicals as per parameters indicated below. All the testing shall be carried out as per schedule API RP 10B.

CEMENT SLURRY FORMULATION:

a) The bidder is required to provide cement slurry formulation for all cementation job along with Technical Bid.

b) The tentative parameters for cement slurry formulation are shown in Annexure I below and the bidder must abide by the mentioned parameters as given in Annexure-I during execution of the jobs. The formulation should be complete showing percentage use of various additives with API class "G" cement. consumptions would be subjected to the well requirement such as temperature, pressure, mud weight, Rheology, volumes, hole size etc. However, prior approval will be required from OIL operations team in this regard for usage of high dosage/parameters of cement additives beyond 15%.

c) **Slurry Formulation Parameters**: BIDDERs are required to furnish along with the bid, slurry design reports and spacer design reports (**Spacer Chemical samples to be submitted**) for different temperature ranges as per the Specification of cement additive packages detailed in Annexure -I:

CONSUMABLE: As per Performa B1

8.2 The BIDDER shall be required to supply Cement & Cement Additives for the wells on the rig as per the quoted rates as per price format. In addition to above, OIL may also purchase other additives, which are in BIDDER's product line and provided along with the bid on as and when required by Operator for the slurry design of any specific well.

8.3 BIDDER is required to keep sufficient quantities of the cement, chemicals and cement additives on stock as per their slurry design/ requirement at BIDDER's/Contractor's base near well site.

8.4 Cement, chemical & Cement additives stock at any point of time unless specifically instructed by company should be in sufficient quantity for cementation of any well as per drilling program. This quantity will be adjusted as per drilling schedule. BIDDER must provide their published Price list for complete Cementing chemicals & additives. Company may procure any such additional items if operational requirement arises.

8.5 Payment for cement, chemicals & cement additives will be made as per actual consumption of additives on monthly basis, if it is lower than the mentioned parameters/dosage as per Annexure I.

8.6 The BIDDER shall maintain the inventory of chemical & material.

In order to confirm the quality of bulk additives supplied by the BIDDER, the fail to meet the desired parameters as tested, then:

a) BIDDER shall be required to replace those additives at their own cost without affecting operations.

b) A variation of 15% (actual agreed formulation tested prior the contract) on dosages and on required parameter of each slurry design shall be accepted due to likely variation of quality of cement from batch to batch and as per operational well requirements such as temperature, pressure, mud weight, Rheology, volumes, hole size etc.

For usage of dosage beyond 15% of a particular cement additive in case of adhoc/abnormal/critical well conditions, prior approval from OIL operations team will be required after testing at BIDDER's laboratory & OIL's laboratory at duliajan. However, OIL reserves the right to reject that particular batch of the cement additive and ask the bidder to replace the entire stock/batch of that cement additive if the proposed dosage by the bidder is not acceptable to the operations team.

8.7 All cement additives/chemicals supplied by the BIDDER shall confirm to international packaging standard and shall have shelf life of minimum one year from the date the chemical reach the operation base located near well site. All additives in sacks / drum shall be handled in proper pallets/container for safe & smooth transportation. Cement supplied by the BIDDER shall confirm to international packaging standard and shall have shelf life of minimum 4 months from the date the chemical reach the operation base near well site.

8.8 Bidder will be required to purchase the cement & cement additives to be provided under the services after the issue of Letter of Award.

8.9 **LEFT OVER CHEMICALS & ADDITIVES:**

The Company shall not pay for any left-out cement, cement additives and chemicals brought by the BIDDER. It shall be the liability of the BIDDER to re-export or dispose of (as deemed fit) the leftover cement and cement additives at base/site, after conclusion of the Contract as per existing regulations. At the end of the contract open sacks and drums (after used partially for OIL's cementation job) will be charged back to OIL with proper justification. The contractor shall take sacks or drums, which are not opened at the end of project, back.

The BIDDER shall manage the shifting and cleaning of each site with regard to cement, cement additives and chemicals upon completion of cementing job.

8.10 Any new updated specifications to enhance job performance, mostly API or recognized Non-API practices would be accepted for specific related jobs only after mutual agreement between Company & BIDDER.

8.11 In the event any chemical brand name/category changes occurs during the period of contract, the same shall be acceptable to the Company subject to no change in cost, concentration, properties and test report compliance from the Company's test lab only.

8.12 Any additional new additives / technology products (not in the standard price list or Main Contract Price List) will be supplied only after consultation and acceptance of Company and the same will be quoted on request.

8.13 Tentative total requirement of API class-G cement:560 MT (including 10% extra) for 4 similar wells however Contractor is advised to reassure the requirement as per Job volume and other related factors. Requirement of total quantity of Cement additives/ spacer additives/ pre-flush additive chemicals will be in percentage quantities of required Cement quantities which will be guided by the proposed cement slurry formulation.

Tentative Quantum of Jobs to be performed:

a. Estimated primary Cementing Jobs : 17 Nos.
b. Estimated Secondary (Plug + squeeze) job : 36 Nos.
c. Allied Jobs like BOP testing, LOT/PIT etc. : 12 Nos.

9.0 JOB SIMULATION:

The BIDDER shall submit recommendations for mechanical aids and chemical aids such as centralizers placement, pre-flush design, spacer design, cement slurry design (including requirement of additives), casing running in speed, pumping & displacement rate, regime of flow job schedule based on u-tube simulator results, gas migration risk analysis, estimation of BHCT etc. based on computer aided design and computer simulation results for all the casing cementation jobs on which they are providing services.

10.0 TESTING FACILITY & CEMENT SLURRY FORMULATION:

i) The BIDDER should have the adequate facilities to test cement additives and design cement slurry. BIDDER's laboratory must be located in India for testing cement, additives and for designing cement slurry as per API 10B standards. In addition to this, the BIDDER may be required to carry out cement testing jobs beyond the scope of API 10B, if operational requirement arises.

Post cement job testing of any kind, if required has to be carried out by the BIDDER. At OIL's discretion, such testing at BIDDER's laboratory may be witnessed by OIL's representative. Also OIL reserves the right to carry out Post-Cement job analysis. For this purpose, Contractor needs to supply the additives used in the respective job. In addition, one laboratory with testing facilities should be available at base office in Duliajan for the validation of the test reports (in line with Clause 2.4 of SOW).

ii) The BIDDER is required to provide documentary evidence on various facility, tools & equipment available in the laboratory to undertake cement formulation & slurry design covering all parameters

iii) The BIDDER is required to provide printed literature on tools / equipment available in the LABORATORY

11.0 REPORTING:

11.1 General:

BIDDER shall comply with the following reporting requirements as a minimum. BIDDER shall also provide additional reports to the Company Representative as may reasonably be requested during the Work.

11.2 Materials Inventory

An up-to-date inventory of all cement & cement additives held on stock should be provided to Company on weekly and as used basis. Such an inventory can never fall below a pre-determined critical level. A weekly report shall be submitted to the concerned Company Representative of Drilling Department.

11.3 Job Report

Report of an acceptable standard shall be submitted, on a job basis to the concerned Company Representative of Drilling Department.

11.4 BIDDER to submit the following prior to Mobilization for Company's approval:

A. MSDS Sheets for each chemical or cement additive.

B. BIDDER's safety manual and procedure and a safety policy covering but not limited to the following aspects:

a) Safety training policy
b) Safety reporting and analysis
c) Safety of personnel
d) Protective clothing and appliances
e) Fire
f) First Aid

12.0 MOBILIZATION OF TOOLS/EQUIPMENT/CONSUMABLES/SPARES

The BIDDER shall mobilize all the tools & equipment & sufficient inventory in a package to meet contractual obligation for carrying out assigned jobs.

Particulars	Mobilization Time
Mobilization of equipment, tools, accessories, consumables & associated Services including manpower as per Scope of Work.	Within 75 days of issue of Letter of award by Company.

Interim remobilization of BIDDER's tools and equipment, accessories, spares etc.	Within 45 days of Mobilization notice issued by the Company
Additional/Optional Services	
Mobilization of Optional Tools & equipment etc.	Within 75 days of Mobilization notice issued by the Company

13.0 **INSTALLATION/ DISMANTLING/ INTER LOCATION MOVEMENT/ DEMOBILISATION:**

a) All tools/equipment/ accessories/consumables is to be mobilized first to designated well site at Tripura.

b) The equipment is to be installed and made operational for carrying out assigned jobs at each required location. Crane services if required for the service will be provided by OIL.

c) The equipment is to be dismantled at each well at the end of operation there.

d) Movement of tools/equipment/accessories from location to base and then to subsequent locations will be the responsibility of the BIDDER.

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CEMENTING SERVICES **Annexure-A**

ANNEXURE-I

1.0 **DESCRIPTION OF ITMES: CEMENT ADDITIVES**
NUMBERS OF PACKAGES FOR 2 YEARS (1 Package = 1 MT Cement)
1) SERVICE PACKAGE1 (20-40°C BHCT, BHP-400 psi, mud wt.-8.52ppg) = 4 JOBS – conductor cementing, cement rise up to surface, depth range- 200 to 300m (approx.), single slurry density-15.24 ppg) = **215 Packages** (Cement Quantity per job = 53.75 MT Approx.)
2) SERVICE PACKAGE2 (66°C BHCT, BHP-2331 psi, mud wt.-9.12ppg) = 4 JOBS – isolation cementing, cement rise up to surface, depth range- 500 to 1500m (approx.), slurry density (lead- 13.64ppg, tail- 15.77 ppg) 1. 2A (Lead Slurry -13.6 ppg): 4 Jobs (**141 Packages**) 2. 2B (Tail Slurry- 15.8 ppg): 4 Jobs (**53 Packages**) (Cement Quantity per job = 48.5 MT Approx.)
3) SERVICE PACKAGE3 (78°C BHCT, BHP-5500 psi, mud wt.-12.9ppg) =1 JOB – isolation cementing, cement rise-200m inside last csg. shoe, depth range- 2500m (approx.), slurry density (lead- 13.64ppg, tail- 15.77 ppg) 3. 3A (Lead Slurry -13.6 ppg): 1 Job (**29 Packages**) 4. 3B (Tail Slurry- 15.8 ppg): 1 Job (**10 Packages**) (Cement Quantity per job = 39 MT Approx.)
4) SERVICE PACKAGE4 (66°C BHCT, BHP-2331 psi, mud wt.-9.12ppg) = 2 JOBS – Production casing cementing with Gas block additives, cement rise-100m inside last csg. shoe, depth range- 800m-1400m (approx.), slurry density - 15.8 ppg) = **33 packages**
5) SERVICE PACKAGE5 (78°C BHCT, BHP-5500 psi, mud wt.-12.9 ppg) = 1 JOB – Production casing cementing with Gas block additives, cement rise- 100 m inside last csg. shoe, depth - 2300m (approx.), slurry density-15.8 ppg) = **27 packages**
6) SERVICE PACKAGE6 (90-103°C BHCT, BHP-7283 psi, mud wt. -13.35 ppg) = 1 JOB – Production casing cementing with Gas block additives, cement rise- 100 m inside last csg. shoe, depth - 3200m (approx.), slurry density-15.8 ppg) = **27 packages**
7) SERVICE PACKAGE7(Secondary Cementing) temperature 84°C BHCT(BHST-103°C) – 4 jobs (**20 Packages**) (Cement Quantity per job = 5 MT Approx.)
8) SERVICE PACKAGE7.1(Secondary Cementing) temperature 64°C BHCT(BHST-78°C) – 12 jobs (**6**0 **Packages**) (Cement Quantity per job = 5 MT Approx.)
9) SERVICE PACKAGE8 (Open Hole plug job) temperature range of 84^{0}C BHCT (BHST 103^{0}C)- 5 jobs **(100 Packages**) (Cement Quantity per job = 20 MT Approx.)
10) SERVICE PACKAGE8.1 (Open Hole plug job) temperature range of 64^{0}C BHCT (BHST 78^{0}C)- 15 jobs (**300 Packages**) (Cement Quantity per job = 20 MT Approx.)
11) SERVICE PACKAGE9: Cement additives for lost circulation for temperature range of 84 °C BHCT (BHST 103 °C) – (**200-Packages**)

2.0 RECOMMENDED PRESSURE - TEMPERATURE RANGE, TESTING CONDITIONS AND CEMENT SLURRY PROPERTIES FOR DIFFERENT PACKAGES :

2.1 SERVICE PACKAGE-1: (Conductor cementing) Cement additives for temperature range 38°C BHCT: 215 packages along with defoamer. Test report will be assessed at 38°C. (BHST 40°C)

1.0	**SLURRY TYPE**	Cement slurry design should consists of API class 'G' HSR type and fresh water, having a density of 15.24 ppg (114 lbs/cft)
2.0		**PHYSICAL PROPERTIES**
2.1	PHYSICAL STATE	Additives as received should be free flowing powder or homogeneous liquid free from visible impurities
2.2	Solubility in water	Additives will be pre-hydrated except for Lightweight additives; which are to be dry blended & soluble or dispersible in fresh water.
2.3	Moisture content% by mass	10.0(max)
3.0		**SLURRY PROPERTIES**
3.1	Thickening time at HTHP consistometer at 38°C and 500 psi (Pressure to be raised in 44 minutes)	200 to 250 minutes (Min) for 100 Bc
3.2	Fluid loss as per API	N/A
3.3	Free water as per API	Trace
3.4	Initial consistency	10 - 15 BC (Max)
3.5	24 hrs compressive strength BHST as per API schedule	500 psi (Min)
4.0		**TESTING PARAMETERS**
4.1	BHCT	30 - 45°C to test at 38°C
4.2	BHST	35-55°C to test at 40°C
4.3	Bottom hole pressure	2000 psi
4.4	Time to raise temp. and pressure	44 minutes
4.5	Slurry specific gravity	1.83 (114 lbs/cft)

2.2 SERVICE PACKAGE-2: Cement additives for Isolation Casing for the temperature range of 55°C BHCT- 9 5/8" & 13 3/8" inch Casing Jobs: 194 packages along with defoamer. Test report will be assessed at 55°C. (BHST 66°C)

1	**SLURRY TYPE**	***Lead Slurry***: Cement slurry design should consists of API class 'G' HSR type and fresh water, having a density of 13.64 ppg (102 pcf) ***Tail Slurry***: Cement slurry design should consist of API class 'G' HSR type and fresh water, having a density of 15.8 ppg (118 pcf)
2		**PHYSICAL PROPERTIES**
2.1	PHYSICAL STATE	Additives as received should be free flowing powder or homogeneous liquid free from visible impurities
2.2	Solubility in water	Additives will be pre-hydrated except for Lightweight additives; which are to be dry blended & soluble or dispersible in fresh water.

2.3	Moisture content % by mass	10.0(max)
3.0	**SLURRY PROPERTIES**	
3.1	Thickening time at HTHP consistometer at 55^{0}C and 2500 psi (Pressure to be raised in 44 minutes)	Lead : 270 to 300 minutes (Min) for 100Bc Tail : 270 to 300 minutes (Min) for 100Bc.
3.2	Water loss as per API	Lead: 100 ml/30 min(Max) Tail : 50 ml/30 min(Max)
3.3	Free water as per API	Lead : Trace Tail : Nil
3.4	Initial consistency	Lead: 25 - 30 BC (Max) Tail : 10 - 15 BC (Max)
3.5	24 hrs compressive strength at BHST as per API schedule	Lead: 500 psi (min) Tail : 2000 psi (Min)
4		**TESTING PARAMETERS**
4.1	BHCT	50°-60^{0}C to test at 55°C
4.2	BHST	55-70°C to test at 66°C
4.3	Bottom hole pressure	2500 psi
4.4	Time to raise temp. and pressure	44 minutes
4.5	Slurry specific gravity	Lead: 1.63(102 lbs/cft) Tail: 1.9(118 lbs/cft)

2.3 SERVICE PACKAGE-3: Cement additives for <u>Intermediate Isolation Casing</u> for the temperature range of 64^{0}C BHCT- 9 5/8" inch Casing Jobs: 39 packages along with defoamer. Test report will be assessed at 64^{0}C. (BHST 78^{0}C)

1	**SLURRY TYPE**	***Lead Slurry***: Cement slurry design should consists of API class 'G' HSR type and fresh water, having a density of 13.64 ppg (102 pcf) ***Tail Slurry***: Cement slurry design should consists of API class 'G' HSR type and fresh water, having a density of 15.8 ppg (118 pcf)
2		**PHYSICAL PROPERTIES**
2.1	PHYSICAL STATE	Additives as received should be free flowing powder or homogeneous liquid free from visible impurities
2.2	Solubility in water	Additives will be pre-hydrated except for Lightweight additives; which are to be dry blended & soluble or dispersible in fresh water.
2.3	Moisture content % by mass	10.0(max)
3		**SLURRY PROPERTIES**
3.1	Thickening time at HTHP consistometer at	Lead : 270 to 300 minutes (Min) for 100Bc Tail : 270 to 300 minutes (Min) for 100Bc.

	Lead: 64^{0}C and 5500 psi (Pressure to be raised in 44 minutes)	
3.2	Water loss as per API	Lead: 100 ml/30 min(Max) Tail : 50 ml/30 min(Max)
3.3	Free water as per API	Lead : Trace Tail : Nil
3.4	Initial consistency	Lead: 25 - 30 BC (Max) Tail : 10 - 15 BC (Max)
3.5	24 hrs compressive strength at BHST as per API schedule	Lead: 500 psi (min) Tail : 2000 psi (Min)
4		**TESTING PARAMETERS**
4.1	BHCT	60-75°C to test at 64°C
4.2	BHST	70-85°C to test at 78°C
4.3	Bottom hole pressure	5500 psi
4.4	Time to raise temp. and pressure	44 minutes
4.5	Slurry specific gravity	Lead: 1.63 (102 lbs/cft) Tail: 1.9 (118 lbs/cft)

2.4 SERVICE PACKAGE-4: (Oil string casing cementing) Cement additives for temperature range 55°C BHCT: 33 packages along with defoamer. Test report will be assessed at 55°C. (BHST 66°C)

1.0	**SLURRY TYPE**	Cement slurry design should consists of API class 'G' HSR type and fresh water, having a density of 15.8 ppg (118 lbs/cft)
2.0		**PHYSICAL PROPERTIES**
2.1	PHYSICAL STATE	Additives as received should be free flowing powder or homogeneous liquid free from visible impurities
2.2	Solubility in water	Additives will be pre-hydrated except for Lightweight additives; which are to be dry blended & soluble or dispersible in fresh water.
2.3	Moisture content% by mass determined at 60-85^{0}C	10.0(max)
3.0		**SLURRY PROPERTIES**
3.1	Thickening time at HTHP consistometer at 55°C and 2500 psi (Pressure to be raised in 44 minutes)	270 to 300 minutes (Min) for 100Bc
3.2	Fluid loss as per API	45 ml/30 min(Max)
3.3	Free water as per API	Trace
3.4	Initial consistency	10 - 15 BC (Max)
3.5	24 hrs compressive strength BHST as per API schedule	2000 psi (Min)
3.6	Static gel strength using Static Gel Strength (SGS) analyzer (recommended in API)	45 min (max) transition time from 100 lbf/100ft^2 to 500 lbf/100ft^2
4.0		**TESTING PARAMETERS**
4.1	BHCT	45 - 60°C to test at 55°C
4.2	BHST	55-70°C to test at 66°C
4.3	Bottom hole pressure	2500 psi

4.4	Time to raise temp. and pressure	44 minutes
4.5	Slurry specific gravity	1.90(118 lbs/cft)

2.5 SERVICE PACKAGE-5: (Oil string casing cementing) Cement additives for temperature range 64°C BHCT: 27 packages along with defoamer. Test report will be assessed at 64°C. (BHST 78°C)

1.0	**SLURRY TYPE**	Cement slurry design should consists of API class 'G' HSR type and fresh water, having a density of 15.8 ppg (118 lbs/cft)
2.0		**PHYSICAL PROPERTIES**
2.1	PHYSICAL STATE	Additives as received should be free flowing powder or homogeneous liquid free from visible impurities
2.2	Solubility in water	Additives will be pre-hydrated except for Lightweight additives; which are to be dry blended & soluble or dispersible in fresh water.
2.3	Moisture content% by mass	10.0(max)
3.0		**SLURRY PROPERTIES**
3.1	Thickening time at HTHP consistometer at 64°C and 5500 psi (Pressure to be raised in 44 minutes)	300 to 360 minutes (Min) for 100Bc
3.2	Fluid loss as per API	45 ml/30 min(Max)
3.3	Free water as per API	Trace
3.4	Initial consistency	10 - 15 BC (Max)
3.5	24 hrs compressive strength BHST as per API schedule	2000 psi (Min)
3.6	Static gel strength using Static Gel Strength (SGS) analyzer (recommended in API)	45 min (max) transition time from 100 lbf/100ft^2 to 500 lbf/100ft^2
4.0		**TESTING PARAMETERS**
4.1	BHCT	60 - 75°C to test at 64°C
4.2	BHST	70-85°C to test at 78°C
4.3	Bottom hole pressure	7000 psi
4.4	Time to raise temp. and pressure	44 minutes
4.5	Slurry specific gravity	1.90(118lbs/cft)

2.6 SERVICE PACKAGE-6: (Oil string casing cementing) Cement additives for temperature range 74-84°C BHCT: 27 packages along with defoamer. Test report will be assessed at 74-84°C. (BHST 90-103°C)

1.0	**SLURRY TYPE**	Cement slurry design should consists of API class 'G' HSR type and fresh water, having a density of 15.8 ppg (118 lbs/cft)
2.0		**PHYSICAL PROPERTIES**
2.1	PHYSICAL STATE	Additives as received should be free flowing powder or homogeneous liquid free from visible impurities

2.2	Solubility in water	Additives will be pre-hydrated except for Lightweight additives; which are to be dry blended & soluble or dispersible in fresh water.
2.3	Moisture content% by mass	10.0(max)
3.0		**SLURRY PROPERTIES**
3.1	Thickening time at HTHP consistometer at 74-84°C and 7500 psi (Pressure to be raised in 44 minutes)	300 to 360 minutes (Min) for 100Bc
3.2	Fluid loss as per API	45 ml/30 min(Max)
3.3	Free water as per API	Trace
3.4	Initial consistency	10 - 15 BC (Max)
3.5	24 hrs compressive strength BHST as per API schedule	2000 psi (Min)
3.6	Static gel strength using Static Gel Strength (SGS) analyzer (recommended in API)	45 min (max) transition time from 100 lbf/100ft^2 to 500 lbf/100ft^2
4.0		**TESTING PARAMETERS**
4.1	BHCT	**75-90**°C to test at **84**°C
4.2	BHST	**85-108**°C to test at **103^0**C
4.3	Bottom hole pressure	7500 psi
4.4	Time to raise temp. and pressure	44 minutes
4.5	Slurry specific gravity	1.90(118lbs/cft)

2.7 SERVICE PACKAGE-7: Cement additives for <u>secondary cementing</u> for the temperature range of 84^{0}C BHCT (BHST 103^{0}C) -: Test report will be assessed at 84^{0}C. (BHST 103^{0}C)

1	Slurry type	Cement slurry design should consists of API class 'G' HSR type and fresh water, having a density of 15.8 ppg (118 lbs/cft).
2		**PHYSICAL PROPERTIES**
2.1	PHYSICAL STATE	Additives as received should be free flowing powder or homogeneous liquid free from visible impurities
2.2	Solubility in water	Additives will be pre-hydrated except for Lightweight additives, which are to be dry blended & soluble or dispersible in fresh water.
2.3	Moisture content % by mass	10.0(MAX)
3		**SLURRY PROPERTIES**
3.1	Thickening time at HTHP consistometer at 84°C and 7500 psi (Pressure to be raised in 44 minutes)	300 to 360 minutes (Min) for 100Bc
3.2	Fluid loss as per API	50 ml/30 min(Max)
3.3	Free water as per API	Trace
3.4	Initial consistency	10 - 15 BC (Max)
3.5	24 hrs compressive strength BHST as per API schedule	2000 psi (Min)
3.6	Static gel strength using Static Gel Strength (SGS) analyzer (recommended in API)	45 min (max) transition time from 100 lbf/100ft^2 to 500 lbf/100ft^2

3.7	Linear Expansion	0.2 %(Min) in 5 Days
4		**TESTING PARAMETERS**
4.1	BHCT	75-90°C to test at 84°C
4.2	BHST	85-108°C to test at 103°C
4.3	Bottom hole pressure	7500 psi
4.4	Time to raise temp. and pressure	44 minutes
4.5	Slurry specific gravity	1.90 (118lbs/cft)

2.7.1 SERVICE PACKAGE-7.1: Cement additives for <u>secondary cementing</u> for the temperature range of 64^{0}C BHCT (BHST 78^{0}C) -: Test report will be assessed at 84^{0}C. (BHST 103^{0}C)

1	Slurry type	Cement slurry design should consists of API class 'G' HSR type and fresh water, having a density of 15.8 ppg (118 lbs/cft).
2		**PHYSICAL PROPERTIES**
2.1	PHYSICAL STATE	Additives as received should be free flowing powder or homogeneous liquid free from visible impurities
2.2	Solubility in water	Additives will be pre-hydrated except for Lightweight additives, which are to be dry blended & soluble or dispersible in fresh water.
2.3	Moisture content % by mass	10.0(MAX)
3		**SLURRY PROPERTIES**
3.1	Thickening time at HTHP consistometer at 84°C and 5500 psi (Pressure to be raised in 44 minutes)	300 to 360 minutes (Min) for 100Bc
3.2	Fluid loss as per API	50 ml/30 min(Max)
3.3	Free water as per API	Trace
3.4	Initial consistency	10 - 15 BC (Max)
3.5	24 hrs compressive strength BHST as per API schedule	2000 psi (Min)
3.6	Static gel strength using Static Gel Strength (SGS) analyzer (recommended in API)	45 min (max) transition time from 100 lbf/100ft^2 to 500 lbf/100ft^2
3.7	Linear Expansion	0.2 %(Min) in 5 Days
4		**TESTING PARAMETERS**
4.1	BHCT	60-75°C to test at 64°C
4.2	BHST	70-85°C to test at 75°C
4.3	Bottom hole pressure	5500 psi
4.4	Time to raise temp. and pressure	44 minutes
4.5	Slurry specific gravity	1.90 (118lbs/cft)

2.8 SERVICE PACKAGE-8: Cement additives for <u>open hole plug cementing</u> for the temperature range of 84^{0}C BHCT (BHST 103^{0}C) -: Test report will be assessed at 84^{0}C. (BHST 103^{0}C)

1	Slurry type	Cement slurry design should consists of API class 'G' HSR type and fresh water, having a specific gravity 1.90 (118 lbs/cft)
2		**PHYSICAL PROPERTIES**
2.1	PHYSICAL STATE	Additives as received should be free flowing powder or homogeneous liquid free from visible impurities

2.2	Solubility in water	Additives will be pre-hydrated except for Lightweight additives, which are to be dry blended & soluble or dispersible in fresh water.
2.3	Moisture content % by mass determined at 60-85^{0}C	10.0(MAX)
3		**SLURRY PROPERTIES**
3.1	Thickening time at HTHP consistometer at 84°C and 7500 psi (Pressure to be raised in 44 minutes)	300 to 360 minutes (Min) for 100Bc
3.2	Fluid loss as per API	50 ml/30 min(Max)
3.3	Free water as per API	Trace
3.4	Initial consistency	10 - 15 BC (Max)
3.5	24 hrs compressive strength BHST as per API schedule	2000 psi (Min)
4		**TESTING PARAMETERS**
4.1	BHCT	75-90°C to test at 84°C
4.2	BHST	85-108°C to test at 103°C
4.3	Bottom hole pressure	7500 psi
4.4	Time to raise temp. and pressure	44 minutes
4.5	Slurry specific gravity	1.90(118lbs/cft)

2.8.1 SERVICE PACKAGE-8.1: Cement additives for open hole plug cementing for the temperature range of 64^{0}C BHCT (BHST 78^{0}C) -: Test report will be assessed at 840C. (BHST 1030C)

1	Slurry type	Cement slurry design should consists of API class 'G' HSR type and fresh water, having a specific gravity 1.90 (118 lbs/cft)
2		**PHYSICAL PROPERTIES**
2.1	PHYSICAL STATE	Additives as received should be free flowing powder or homogeneous liquid free from visible impurities
2.2	Solubility in water	Additives will be pre-hydrated except for Lightweight additives, which are to be dry blended & soluble or dispersible in fresh water.
2.3	Moisture content % by mass determined at 60-85^{0}C	10.0(MAX)
3		**SLURRY PROPERTIES**
3.1	Thickening time at HTHP consistometer at 84°C and 5500 psi (Pressure to be raised in 44 minutes)	300 to 360 minutes (Min) for 100Bc
3.2	Fluid loss as per API	50 ml/30 min(Max)
3.3	Free water as per API	Trace
3.4	Initial consistency	10 - 15 BC (Max)
3.5	24 hrs compressive strength BHST as per API schedule	2000 psi (Min)
4		**TESTING PARAMETERS**
4.1	BHCT	60-75°C to test at 64°C
4.2	BHST	70-85°C to test at 78°C
4.3	Bottom hole pressure	5500 psi

4.4	Time to raise temp. and pressure	44 minutes
4.5	Slurry specific gravity	1.90(118lbs/cft)

2.9 SERVICE PACKAGE 9: Cement additives for lost circulation for the temperature range of 84^{0}C BHCT (BHST 103^{0}C) -:

a) 200 bbls of spacer for Reservoir Section i.e. 50 bbls per job
b) 500 bbls of spacer for Non Reservoir Section i.e. 50 bbls per job
c) Lost Circulation Material for 1000 bbls of cement slurry i.e. LCM to be mixed with last 100 bbls of cement slurry per job

1	**Lost Circulation Material**	
		1) Lost Circulation Spacer for Reservoir Section ***2)*** Lost Circulation Spacer Material for Non Reservoir section ***3)*** Lost Circulation Material for Cement Slurry
2		**PHYSICAL PROPERTIES**
2.1	PHYSICAL STATE	
		• • Additives as received should be applicable for reservoir section; and must not leave any skin behind (degradable) • • Non reservoir section shall have lost circulation material as spacer and fibers in cement slurry • • Calcium Carbonate, Barite and Bentoite will be provided by company
3		**TESTING PARAMETERS**
3.1	BHCT	75 – 90°C to test at 84°C
3.2	Bottom hole pressure	7500 psi
3.3	Time to raise temp. and pressure	44 minutes

General Note:

1. Suitable spacer design by maintaining density hierarchy and volume of maximum 100US barrels or 500 ft in the annulus whichever is lower, for each of the above service packages and chemicals required for the spacer should be provided by the BIDDER. The said parameters are for Water Based Mud only. Bentonite concentration should not be more than 4lbs/bbl while designing the spacer.

2. Silica Flour and API Class 'G' cement, Calcium Carbonate, Barite and Bentonite shall be supplied by OIL. In addition to the above, SAPP will also be provided by OIL.

3. Mixing Tank: Oil will provide mixing tanks with agitators and centrifugal pumps for mixing Pre-Flush/ Spacers / Cement Mix fluid. Bidder to consider a dead volume of approx. 35 Bbls in each of these tanks while quoting against the service.

ADDITIONAL SERVICE PACKAGE

BIDDER to indicate additional items required for the solutions to the following mentioned problems. If required Company may go for purchase of the additives/chemicals and avail the service.

1. Loss circulation during drilling.
2. Chemical additives to enhance shear bond of the cement slurry.
3. Chemical additives to provide enhanced mechanical properties to cement slurry.
4. Prevent washout open hole sections.
5. A solids free fluid system with Newtonian fluid behaviour which can penetrate to remediate issues viz. micro-annuli, tight casing leaks, annular gas migration, sustained casing pressure, gravel pack repair, water breakthrough, etc.

B. SCHEDULE OF RATE (SOR)

DESCRIPTION OF WORK/SERVICE: Hiring of Cementing Services along with 01(One) numbers of Cementing Unit.

Item No.	Description of Services	UOM	Estimated Quantity	Rate (Rs.) excluding GST	Amount (Rs.) excluding GST
A.	**HIRING OF CEMENTING SERVICES INCLUDING 1 NUMBERS OF CEMENTING UNIT**				
A1	Mobilization Charges for Units/Equipment	LSM (Lumpsum)	1		
A2	Demobilization charges for Units/Equipment	LSM (Lumpsum)	1		
A3	Interim Demobilisation Charges for units/equipment/Manpower etc.	LSM (Lumpsum)	4		
A4	Interim Re-mobilisation Charges for units/equipment/Manpower etc.	LSM (Lumpsum)	4		
B.	**RENTAL CHARGES OF UNIT / EQUIPMENT CONSISTING OF:**				
B1	Monthly rental rate of Cementing Unit	MON (Month)	24		
B2 Cementing head with quick change adaptor:					
I.	13 3/8" Standard double plug Cementing Head.	MON (Month)	48		
II.	9 5/8" Standard double plug Cementing Head	MON (Month)	48		
III.	7" Standard double plug Cementing Head	MON (Month)	48		
IV.	5 ½" Standard double plug Cementing Head	MON (Month)	48		
V.					
B3	Rental for 2" Chiksan Loop	MON (Month)	24		

CEMENTING SERVICES **Annexure-A**

B4	LOT - Leak of Test/BOP-casing pressure test	NO (Number)	15		
C	Charges for Cementing Engineer and crew	MON (Month)	24		
D	Operational charges Per Cement Job	EA (Each Activity)	60		
E	**BATCH MIXER**				
E1	Mobilization charges for Batch Mixer	LSM (Lumpsum)	1		
E2	Day Rate charges for Batch Mixer	DAY	60		
E3	Demobilization charges for Batch Mixer	LSM (Lumpsum)	1		
F	**CEMENT STORAGE SILO SET (3000 CFT) AT RIG SITE**				
F1	Monthly rental rate of Cementing Unit	MON (Month)	24		
G	**MIXING WATER TANK SYSTEM AT SITE**				
G1	Monthly rental rate of Cementing Unit	MON (Month)	24		
H	**COST OF ADDITIVES (IMPORTED + INDIGENOUS)**				
H1	Cost of Additives as per Proforma B1-Imported	LSM (Lumpsum)	1		
H2	Cost of Additives as per Proforma B1-Indegenous	LSM (Lumpsum)	1		
Total Cost (Rs.) excluding GST					
Total Cost (Rs.) including GST @12%					

1. Tenure of Agreement: 02 (two) years with a provision of extension by another 01 (One) year

2. Mobilization Period: 90 (Ninety) days from the date of issue of mobilization notice.

Break up of the charges of Personnel			
Sl No	**Description**	**UOM**	**Unit Rate**
1	One No. of Cementing Engineer	DAY	
2	One No. of Cementing Operator /Cementer	DAY	
3	One No. of Cementing Assistant/Helper/ Cement silo/bulk plant operator/ Mixing water tank operator	DAY	

General Notes:

The rates as incorporated in Proforma-B and payable by the Company under the full and proper performance of contractor's contractual obligations as per provisions of this contract will be governed by the following:

The bidder shall quote the rates/prices in their Price Bid strictly as per PROFORMA-B (TABLE-A & TABLE-B). The quantity/parameter/No. of Days etc. shown against each item in the Tables is tentative and valid for Bid Evaluation purpose only. Payment to the successful Bidder/Contractor shall be made on the basis of actual utilization/work done/quantity consumed. All "DAY RATE" charges shall be quoted for 24 hours a day basis. But, for part of a day, the same shall be payable on pro-rata up to the nearest half an hour basis. Commercial evaluation of Bids to establish inter-se ranking of all technically qualified bidders will be done based on the rates/charges quoted in these Tables only.

1.0 MOBILISATION CHARGES:

1.1 Mobilization charges shall be applicable on lump sum basis as per price schedule format (Proforma - B) and should cover all local , foreign costs (if any) of the contractor to mobilize the equipment and crew as per requirement (ref. 5.0& 6.0 of Part-II) to any OIL's drilling location within geographical reach of North Eastern India, including all local taxes, port fees, inland transport etc., but excluding Customs duty (which will be to the Company's account, if applicable) on the items declared in Proforma - A & should cover travel expenses, in-transit accommodation charges, personal insurance etc. for personnel. GST as applicable will be paid by OIL.

1.2 Mobilization will be considered as completed when all the operating tools/equipment are received and tools/equipment are tested/calibrated to its rated specifications successfully along with crew at any OIL's drilling location within geographical reach of North Eastern India and is ready for the services as defined hereunder.

1.3 Mobilization charges will be payable when all equipment & crew are positioned to undertake/commence the work at the first location and duly certified by the Company's Engineer and on successful completion of 1st job within 10 days ofcompletion of mobilization of equipment and personnel by the contractor.

In the event of non-assignment of 1st job within the stipulated 10 days as mentioned above, 50% of the mobilization charges shall be released and rental payment shall start from the 11th day.

1.4 Any demurrage accrued on account of delay in clearance through customs, if any, will be on Contractor's account. The Company will provide necessary assistance to the extent possible if required for customs clearance on receipt of request from the contractor and all such request must be made well in advance (at least 20 days).

1.5 Company at its discretion may allow cementing operation to start without completed mobilization, provided it is possible to start first cementing job with the items since mobilized. However, the shortfall items must be mobilized by the Contractor immediately thereafter. If Company permits the Contractor to start cementing job without completed mobilization, only 80% of Mobilization charges will become payable to the Contractor and the remaining 20% of mobilization charges will be deducted as penalty over and above the liquidated damages as set out in the Contract, which will not be paid by Company even after the shortfall items are made available. However, notwithstanding this provision for partial mobilization, Contractor must make all-out effort for mobilization of Cementing Units, equipment, tools and accessories etc. as per the contractual provisions.

1.6 Payment towards mobilization of the Units /Equipment & Personnel shall not exceed 3 % of the total contract price for 2 years. However, mobilization charges if

quoted in excess of 3 % of the estimated contract cost, the excess amount shall be paid at the end of the contract.

2.0 RENTAL CHARGES FOR EQUIPMENT PER MONTH:

i) Equipment, tools, accessories etc.(including Cementing Unit and laboratory) required for performance of the services are furnished vide 5.0 of Part-II for which monthly rental charges per equipment shall be as per Proforma-B.

ii) Rental charges for equipment for cementing services shall be applicable from the date of completion of mobilization.

iii) The monthly rental charges shall include supply of spares and consumables, replacement / maintenance cost and any other operational requirements if any during the contractual period.

iv) All other necessary equipment, tools and accessories etc. will be provided by the Contractor for due performance of the intended services without any additional rental charges to Company.

v) Rental will not be payable, if the Contractor withdraws the whole or part of the equipment or any manpower affecting operations.

vi) Rental will be payable for full month or part thereof on pro-rata basis.

vii) If, Contractor's tool/equipment fails to perform, for any reason in the duration of

operation, then no RENTAL shall become payable until the equipment/tool is put back into operating condition or evidenced by demonstration of operation in actual tests or use to the satisfaction of OIL.

3.0 BATCH MIXER:

i) Contractor to quote for 100 Bbl. Capacity Batch Mixer - One No. with followingfinancial parameters:

a) Mobilization Charges
b) De-Mobilization Charges
c) Day Rate Charges (Rental)

ii) Company may exercise the option to hire the service of Batch Mixer during the contractual period depending upon operational requirement.

4.0 COST OF ADDITIVES: As per Proforma-B1: Payment to the contractor shall be made on actual consumption of cement additives.

5.0 PERSONNEL CHARGES PER MONTH:

i) Personnel Charges shall be payable per month basis for running the Cementing Unit and handling other Tools & Equipment for carrying out specific well related jobs.

ii) Contractor to submit attendance sheet along with the invoice in this regard.

iii) In case of shortage of manpower, necessary deduction will be made as per clause 7.5 of Scope of Work/Terms of reference.

iv) Charges for Contractor's personnel ceases with effect from the day, the Company serves the de-mobilization notice to the Contractor.

v) Charges for Contractor personnel will not be payable for the period, the Cementing Unit remains in-operative or non-functional to carry out assigned jobs.

vi) Charges shall not be payable to entire group of Contractor's personnel for a period of 10 days as a penalty, in case of failure of any equipment resulting in poor primary cementing job attributed to the service Provider.

6.0 OPERATIONAL CHARGES:

i) The operational charges for jobs shown in Para 8.0 of Part-II (quantum of jobs to be performed) shall be applicable on per job basis for the actual number of jobs performed.

ii) The operational charges shall include cost of slurry design, testing at contractor's own laboratory in India and actual cementing operation.

ii) The operational charges will be payable only on successful execution of the job.

7.0 DEMOBILISATION CHARGES:

i) The demobilization charges shall be applicable as Lump Sum charges as per Proforma-B which will includes all charges inclusive of demobilization of contractor's all

equipment and crew from any OIL's drilling location within geographical reach of North Eastern India.

ii) Demobilization Charges will be payable to contractor by the Company only once after completion of Company's activity in drilling location against this Contract. The Contractor shall arrange for and execute demobilization of their entire package of Cementing Unit, Tools/Equipment/Spare/Accessories etc. upon receipt of notice from the Company. De-Mobilization shall indicate completion/ termination of the Contract and Contractor shall bear all such costs/charges, if any.

iii) All the charges on Cementing Unit, Tools/Equipment/Spare/Accessories/ Personnel etc., shall cease to exist with effect from the day; the Contractor is issued de-mobilization notice by Company.

iv) All charges connected with demobilization including all fees, duties and taxes in relation thereto, insurance and freight within India or on export/re-export outside India will be to Contractor's account.

v) The Demobilization Charges of the Units /Equipment & Personnel should not be less than 1 % of the total evaluated charges of the contract value. In case de-mob charges quoted less than 1%, the differential amount will be kept on hold from the 1st invoice onwards and the same will be paid at the end of the contract along with Demobilization charges if any. –

8.0 INTERIM DE –MOBILIZATION & RE-MOBILIZATION CHARGES [TOOLS/ EQUIPMENT WITH ACCESSORIES & PERSONNEL]:

i) The Interim Demobilization & Remobilization Charges shall be in LUMP SUM covering rental Tools/Equipment with accessories/manpower. The Company retains the right to De-Mobilize Contractor's Equipment & Tools temporarily and Re-Mobilize the consignment in case of, but not limited to, need for temporary suspension of Company's activity for operational reasons, or any other reason as deemed fit to the company. In such an event these charges in LUMP SUM amount are payable.

Interim Remobilization shall be deemed to be completed when all equipment/tools (free of defects/ encumbrances) are re-installed and re-commissioned at Site and duly certified by the Company Representative/authorized person regarding readiness of the equipment to undertake/ commence the work assigned under the Contract.

ii) No Charges, whatsoever, shall be payable from the time the Interim De-Mobilization notice is issued till Re-Mobilization is completed under Company's advice and duly certified by Company's representative.

iii) The total period of interim demobilization and remobilization during the Contract period for equipment/ tools and accessories shall not exceed 6 (six) months. However, beyond said period, the interim demobilization and remobilization period may be extended by the parties at mutually agreed rates, terms and conditions. The Company, at its discretion, may add back such interim demobilization and remobilization period to the original Contract duration at the same rates, terms and conditions by giving 30 (thirty) days notice to the Contractor before the expiry of the Contract.

9.0 DAY RATE FOR TOOLS/EQUIPMENT/PERSONNEL DURING FORCE MAJEURE:

i) All rates quoted shall be restricted to 50% of respective charges under above circumstances. This will be considered as FORCE MAJEURE RATE.

ii) The Force Majeure Rate shall be payable during the first 15 days period of force majeure in case of all operations. No payment shall accrue to the Contractor beyond the first 15 days period.

10.0 ZERO RATES: Notwithstanding any provision in the contract, no charges shall be payable for the period, the job or activity assigned to the contractor is halted due to break-down of Contractor's Cementing Unit, tools/equipment or non-availability of chemicals, key personnel or for any other reason whatsoever attributable to the Contractor.

11.0 GENERAL NOTES:

i) Company shall give notice to contractor to commence demobilization. Contractor will ensure that demobilization is completed within thirty (60) days of notice from the Company. Company also reserves the right to serve notice for demobilization of any equipment at any point of time at its discretion during the contractual period and the monthly rental charges for equipment will be deducted accordingly.All charges connected with demobilization including all fees, duties and taxes in relation thereto, insurance and freight within India or on export /re-export outside India will be to contractor's account.

ii) Upon completion of duration of contract, the Contractor shall submit their last invoice for payment along with any document(s) as required by the Indian laws and asked for by the Company to enable release of payment.

iii) Documentary evidence regarding submission of returns and payment of tax for expatriate personnel engaged, if any by the contractor.

iv) Proof of re-export of all items (excluding consumables consumed during the contract period) and also cancellation of re-export bond, if any.

v) Any other document as required by applicable Indian Laws and asked by Company.

vi) Contractors should indicate name and address of their Indian agent, if any, and also should specify the percentage of commission if any involved and it should be included in the quoted rates. In case no Indian agent commission is involved then should be shown as "NIL".

vii) The list of items with CIF value to be imported into India in connection with execution of this contract are included in Proforma - A.

viii) From the Proforma-A, Contractor should identify the items of re-exportable in nature (i.e. items which will not be consumed during the execution of the contract and required to be exported outside India after completion of the contract). Total CIF value of such items should be shown in the "PRICE BID FORMAT" as CIF (RE-EX).

ix) Similarly, from the Proforma-A, Contractor should identify the items of consumable in nature (i.e. items which will be consumed during the execution of the contract).

x) Contractor will carry out dismantling operation on receipt of instruction from Company.

12.0 In case, any one of the Cementing Unit is out of order due to any reason beyond 15 days, additionally penalty will be levied at the rate of per day rental rate on pro rata basis apart from zero rate.

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Annexure-B

MUD ENGINEERING SERVICE UNDER EOI FOR "HIRING OF BUNDLED SERVICES (CEMENTING AND MUD ENGINEERING SERVICES) FOR 02 (TWO) YEARS (WITH PROVISION FOR 1-YEAR EXTENSION) FOR DRILLING AND WORKOVER JOBS IN TULAMARA DSF BLOCK."

A. TERMS OF REFERENCE & TECHNICAL SPECIFICATIONS OF MUD ENGINEERING SERVICE

The Contractor shall have to provide Mud Engineering Services including mud laboratory equipped with all desired testing equipment and supply of complete line of additives for drilling fluid in all the phases of drilling wells at Tripura or, any other place of Northeast India. The Bidder shall also provide complete line of service for completion fluid and Workover fluid in all the wells to be drilled/ workover at Tripura. This broadly includes the supply of weighted brines as per requirement along with supply of all chemicals and services required during the well testing period and workover jobs.

BRIEF DETAILS OF SERVICES TO BE PROVIDED BY THE CONTRACTOR:

The Contractor shall provide mud engineering service in totality. The broad scope of work/supply includes but not limited to the following

1. Drilling fluid, Completion fluid and Workover fluid
2. Personnel of Mud Engineering service.
3. Supply of Mud chemicals and Additives
4. Well-site Laboratory with complete testing facility.
5. Mud and material management Services.
6. Leftover chemicals and additive
7. Safety, Health, and Environment.
8. Report generation (Mud Engineering Data & Hydraulics)
9. List of Chemicals and Specification

The description for the above services is as detailed below,

1.0 DRILLING FLUID (MUD), COMPLETION FLUID AND WORKOVER FLUID

1.1 The generic mud design comprising mud type, mud parameters and chemicals/additives proposed to be used for drilling the wells in Tripura are as follows,

i. DRILLING FLUID DESCRIPTION FOR DRILLING WELLS:

a. THREE STAGE DRILLING WELL (LOC: TUL-A/ TUL-B/ TUL-C)

HOLE SIZE	**APPROXIMATE DEPTHS (m)** (TUL-A/ TUL-B/ TUL-C)	**MUD SYSTEM**	**APPROXIMATE MUD DENSITY IN SG* (pcf)**
17 ½"	150/200/300	Bentonite Spud Mud	1.075-1.091 (67-68 pcf)
12¼″	500/800/1500	Polymeric Inhibitive WBM	1.091-1.124 (68-70 pcf)
8 ½″	800/ 1400/2300	Polymeric Inhibitive WBM	TUL-A: 1.124-1.22 (70-76 pcf) TUL-B: 1.124-1.22 (70-76 pcf) TUL-C: 1.25-1.72 (78-107 pcf)
** The mud weights are proposed based on seismic pore pressure profile which are stated to be purely indicative hence, mud weights are subjected to change as per actual drilling evidence. Enough chemicals including Barytes is required to be kept at site and as back up to tackle any unforeseen situations.*			

b. <u>FOUR STAGE DRILLING WELL (TUL-D)</u>

HOLE SIZE	**APPROXIMATE DEPTH (MTRS.)**	**MUD SYSTEM**	**APPROXIMATE MUD DENSITY IN SG* (pcf)**
26"	300	Bentonite Spud Mud	1.075-1.091 (67-68 pcf)
17 ½"	1400	Polymeric Inhibitive WBM	1.075-1.091 (67-68 pcf)
12¼″	2400	Polymeric Inhibitive WBM	1.091-1.124 (68-70 pcf)
8 ½″	3200	Polymeric Inhibitive WBM	1.38-1.926 (86-120 pcf)
** The mud weights are proposed based on seismic pore pressure profile which are stated to be purely indicative hence, mud weights are subjected to change as per actual drilling evidence. Enough chemicals including Barytes is required to be kept at site and as back up to tackle any unforeseen situations.*			

ii. **WORKOVER & COMPLETION FLUID**

The bidder shall supply clear Sodium formate solution as well completion fluid to cater density requirement up to 10.695 ppg during production during well testing stage. Any density requirement above to 10.695 ppg shall be catered by drilling fluid present at well site.

For Workover operations the bidder shall supply clear sodium formate solution along with other chemicals required for carrying workover jobs.

Brine weights may range from 8.32 ppg to 10.695 ppg. The purity of sodium formate supplied at well site should be as per the specification provided in the tender document. Provision for adequate volumes with sufficient back up should be present to cater to any well killing operations during well testing operations.

1.2 NOTE FOR FLUID SERVICES

i. Depending upon the given Geological data, Bidder shall design phase-wise mud program, including but not limited to, all mud parameters, chemical proposed to be used, with total mud volume proposed for each hole section.
ii. Bidder shall submit detailed mud program duly signed by authorized signatory for each section of the hole conforming to OIL's recommended parameters prior to commencement of operation.
iii. Bidder shall prepare contingency plan to meet any down hole complicacies, anticipated contaminations etc. and have back up chemicals ready.
iv. Bidder shall also plan for treatment of cement contamination, caving, hole pack off, differential sticking, Mud loss, hole erosion/ or any other bore hole problems.
v. Bidder shall ensure that composite mud system is environment friendly as per existing environmental laws.
vi. Bidder shall also provide completion brines services for well testing and workover jobs as per well requirements including supply of all required chemicals for workover operations.
vii. Bidder should have requisite R&D facilities in India as well as regional/ Global back up capability of designing and troubleshooting of quoted mud system in terms of detailed analysis. The bidder should have requisite facilities for designing and optimizing rheology properties for the proposed drilling fluid systems.

a) Bidder shall carry out detailed planning and designing, for mud preparation and maintenance required for drilling and completing all phases of wells by using rig equipment and details drilling planned by OIL.
b) Bidder shall provide all the required mud testing equipment for testing of drilling fluid & Completion fluid as per requirement of the well and shall provide skid mounted laboratory at wellsite.
c) Bidder shall submit drilling fluid and well completion report after well completion of the well.
d) Bidder shall provide all technical literatures, hydraulic, surges, swap etc. and all other drilling fluid related calculations and detail mud history and mud programs.
e) Bidder shall provide daily mud report, mud recaps, hydraulic and hole cleaning optimization in real time from the rig site.
f) Bidder is required to facilitate for testing of various HSE related drilling fluid samples, drill Cuttings, effluent and waste water samples as per requirement of state pollution control board/ Central pollution control board and as per HSE regulations of OIL.

1.3 MUD PARAMETERS

1.3.1 Spud mud for Conductor stage

The spud mud shall be prepared using bentonite clay, moderated with cellulosic viscosifiers. High Viscous pill sweeps will be required for proper hole cleaning. The base line of Rheology under normal conditions of drilling to be maintained in the top hole section is as follows however, additional support of viscosity and weight may be required depending on the type of cutting and formation encountered in the top-hole section of the thrust areas of Tripura,

Sl. No.	Mud Parameters	
1	Mud Wt (PCF / SG)	As Described Above
2	MF Viscosity (Sec)	60-55
3	PV (cp)	ALAP
4	YP (Lbs/100ft^2)	10-15
5	Gel (0'/10'/30'/60')	-
6	pH	8.0 – 9.0
7	API fluid loss (cc/30min)	NM
8	Sand Content (% by volume)	<0.25

1.3.2 Polymeric Inhibitive WBM for Isolation stage

Polymeric Inhibitive WBM mud is proposed for isolation sections which shall primarily use cellulosic polymers, clay encapsulator, lubricants etc. The combined inhibition of polymers, glycol, polyamine and K^+ ions is expected to help in dealing with the reactive clay formations (if any) and sealing the permeable zones, helping to avoid downhole problems like torque, drags and differential sticks. Adequate hole cleaning strategy and optimum lubrication will be required to ensure trouble free drilling and clean hole, while drilling thrust areas of Tripura. The generic mud program for isolation stage under normal conditions is as provided below.

Sl No	Mud Parameters	
1	Mud Wt (PCF / SG)	As Described Above
2	MF Viscosity (Sec)	55-50
3	PV (cp)	ALAP
4	YP (Lbs/100ft^2)	15-20
5	Gel (0'/10'/30/60')	Flat Profile
6	pH	9.0 – 9.5
7	API fluid loss (cc/30min)	10-8
8	Sand content (% by volume)	<0.25
9	K^+ ion concentration	1.5% - 3%

**The concentration of potassium ion and mud weight may require to be optimized as per actual drilling evidence.*

1.3.3 Polymeric Inhibitive WBM for Oil string stage

Oil string stage drilling is proposed to be carried using Polymeric Inhibitive WBM System with adequate lubrication. The mud system envisaged for oil string section

shall use xanthan polymers and anionic cellulosic polymers as rheology modifiers and fluid loss controllers respectively, with additional bridging property of micronized calcium carbonate (MCC) and optimum inhibition of K+ ion for reactive clays (if any). Adequate concentration of lubricants to maintain low frictions in deviated section of holes. The generic mud program for oil string stage under normal conditions is as provided below

Sl. No.	**Mud Parameters**	
1	Mud Wt (PCF / SG)	As described above
2	MF Viscosity (Sec)	55-48
3	PV (cp)	ALAP
4	YP (Lbs/100ft^2)	20-30
5	Gel (0'/10')	flat profile
6	pH	8.5 – 9.5
7	API fluid loss (cc/30min)	4 – 5
8	Filter cake (mm)	0.5-1
9	Sand content (% by volume)	<0.25
10	Total Solid content (% by volume)	15-22
11	Lubricity Coefficient	<0.2
12	HTHP at 200°F / 500psi (cc)	<15.0
13	K^+ ion concentration *	1.5-3%

**The concentration of potassium ion and mud weight may require to be changed as per actual drilling evidences.*

2.0 PERSONNEL OF MUD ENGINEERING SERVICES

a. Contractor shall have to deploy two (02) on-site mud engineers (one Lead Mud Engineer and one Second Mud Engineer) on 12-hour shift basis. The on-off pattern of rig personnel must comply with The Mines Act 1952 / The Oil Mine Regulation 2017 with latest amendment.

b. The Mud Engineers (Both lead and second) must have minimum educational qualification of bachelor's degree in engineering/science or equivalent.

c. Lead on-site mud engineer should have knowledge of working with the contractor's materials, equipment and procedures for the services provided by the contractor. Lead mud engineer should have a minimum of five (05) years relevant mud engineering experience and must have performed mud engineering in at least five (05) wells with proposed mud systems. The Mud Engineer should be competent enough/should have sufficient experience in solving down hole complications including but not limited to cement contamination, mud loss, torque/drag, stuck pipe, caving's, high pressure kicks etc.

d. Second on-site mud engineer should have knowledge in working with the contractor's materials, equipment and procedures for the services provided by the contractor. The mud engineer must have a minimum of three (03) years relevant experience and should have performed mud engineering in at least three (03) wells with the proposed mud systems. The Mud Engineer should be competent enough/ should have sufficient experience in solving down hole complications including but not limited to cement contamination, mud loss, torque/drag, stuck pipe, caving's, high pressure kicks etc.

e. The on-site mud engineer shall collect all relevant operational data from driller or, any other data gathering system (e.g. MLU) and record it for taking operational decisions as well as for final well completion report (Mud Recap). The contractor

shall submit the well completion report for the drilled section within 15 days of completion of the well.

f. The Mud Engineers should be in sound health and fit to work in drilling rig in remote locations. The maximum age of the Mud Engineers should not be more than 60 years as on the original bid closing date of the tender. Mud Engineers should be proficient in English (written & verbal). Besides English, fluency in Hindi and/or local language will be an added advantage.

g. Bidder must submit the biodata (as per attached format vide Annexure-2 with copies of all required documents, as specified) of all offered personnel within 20 days of issue of Letter of Award (LoA) or, 30 days prior to commencement of contract (whichever is later) for approval by the Company before commencement of work.

h. The Contractor shall provide the required PPE (Personal Protective Equipment) as per DGMS/OISD to all his personnel at his own cost.

i. Company will provide boarding & lodging facility for two Mud Engineers at site free of charge.

j. Medical Fitness: The Contractor shall ensure that all of the Contractor's Personnel shall have had a full medical examination (by a qualified and registered doctor) prior to commencement of the operation and the certificates of all such personnel in form 'O' of The Mines Act 1952 should be submitted by the contractor.

3.0 SUPPLY OF MUD CHEMICALS AND ADDITIVES

3.1 The selected bidder shall supply and provide all the required chemicals, additives and mud services for preparation and maintenance of mud system at the drilling site.

3.2 Transportation of chemicals, laboratory or, any other entity under mud services, handling of chemicals at well site, transportation of chemicals between locations or, between location and warehouse will be exclusive responsibility of the bidder.

3.3 The Bidder shall ensure that the chemical supplied under the contract shall meet the specifications mentioned in the tender.

3.4 Bidder shall supply complete list of Chemicals and additives including basic chemicals like Bentonite, Barites etc. required for preparation and maintenance of the specific mud systems.

3.5 Bidder shall ensure enough Chemicals and additives shall be made available to allow smooth and uninterrupted operations.

3.6 Bidder shall furnish test reports prior to delivery of chemicals to OIL. All the test reports must reflect the brand name and name of manufacturer as quoted in the bid and the Chemicals used in the wells shall be of the same brand and manufacturer.

3.7 Bidder shall provide the complete Chemical product data sheet including brand name and Manufacturer's name of Chemicals, specifications / test report of chemical and MSDS in respect of all chemicals proposed to be used along with bid.

3.8 OIL reserves the right to check the quality of Chemicals supplied under the contract through random sampling of chemicals (in presence of the contractor's representative) from drilling site/ warehouse/ storage facility for testing at the OIL's central laboratory at Duliajan, during the currency of the contract period. On demand the bidder shall arrange to deliver such samples of chemicals for testing at OIL's Central Chemical laboratory at Duliajan, at his own cost.

3.9 All required Mud Chemicals and Additives shall be delivered by the Contractor at respective well site. Bidder is also required to establish a bulk storage facility/main supply base at Tripura, or, any other place from where any kind of urgent chemical

requirement at well site, can be fulfilled without any problems or, delay. The Contractor is required to stock enough Mud Chemicals and Additives at their nearby supply base/bulk storage facility to meet any eventuality and the stock position must be reviewed and reported to Company Representative on daily basis.

3.10 The Chemicals shall be in original packing of manufacturer. The packing of Chemicals shall be in bags of 25 kg / 50 kg or Lbs, and in drums or jars of not more than 220 L capacities which shall withstand the rigorous handling during transportation. Chemicals susceptible to moisture shall be packed in moisture proof multiwall paper bags with lining. Each container or pallet shall have clearly legible identification marks including the name of chemical, name and address of Manufacturer, date of manufacture and address of consignee. All Chemicals / drums shall be delivered in proper pallet/containers for safe & smooth transportation to well site. The barites of API specifications (min 4.15 sp. Gr.) shall be supplied by the bidder for use.

3.11 Bidder shall be responsible for replacing the chemicals received in torn packing or leaky/broken drums as it will not be sent to well site. Bidder shall deliver all Chemicals, packed in water proof pallets and container.

3.12 Payment shall be made as per actual consumption of Chemicals certified by company representative.

3.13 Barytes of API specifications (min 4.15 sp.gr) shall be supplied by the contractor. It is mandatory that the mercury and cadmium contents of barites should be less than 1mg/kg and 3mg/kg respectively. Barytes failing to this standard will not be accepted.

3.14 **Quality Control:**

(a) Bidder shall have an effective QC procedure that ensures that all chemicals and materials meet the design requirement and comply with the relevant API/ BIS standards as appropriate, and OIL reserves the right to Audit Bidder's QC operation.

(b) To ensure quality of materials as per specifications, bidder shall submit the test report of each of chemical brought to their warehouse prior to usage at the well site.

I If during the operations, any chemical is found to be substandard and/or not conforming to the specifications, bidder shall replace the material immediately.

(d) During the Mud Engineering service, if any foul smell emanates from the mud system due to addition of any of mud additives, successful bidder will be solely responsible for immediate replacement of the chemicals / additives. Service provider to ensure that the replaced chemicals supplied are of equivalent / better make or quality which is devoid of any foul smell.

4.0 WELL SITE LABORATORY & MUD TESTING FACILITY

4.1 The bidder shall provide a suitable well site laboratory (skid mounted) complete with all regular mud checking equipment, chemical reagents and consumables for testing of mud system as indicated under as per API standards.

4.2 The bidder shall have to provide all consumables, glass wares, reagents etc. required for testing of mud including any special tests.

4.3 The equipment/tools are required to be in fully operating condition; repair and preventive maintenance shall be carried without hampering operational requirements.

4.5 All testing equipment as applicable must have valid calibration record conforming to fitness for testing. List of the Laboratory equipment as indicated below shall be made available at wellsite for onsite testing/ analysis. Drilling Fluid testing facility

should include following equipment, reagents and glass wares as provided under but not limited to,

a. SPECIMEN TABLE FOR MUD LIST OF TESTING EQUIPMENT:

Sl. No.	TEST EQUIPMENT PACKAGE	QUANTITY AT RIG
1	Mud Balanced	01
2	Pressurized Mud Balance	01
3	Marsh Funnel with Cup	01
4	Multi Viscometer (OFITE/Fann 35 SA)	01
5	API Filtrate test cell	01
6	Mud Retort Kit	01
7	Sand Content Kit	01
8	pH meter	01
9	Lubricity tester	01
10	Portable Laboratory Centrifuge (Electric) with centrifuge tube	01
11	Hamilton beach mixture with cup	01
12	Digital Weighing Balance	01
13	Glass thermometer 0^0C to 150 ^{0}C	01
14	Handheld Refractometer	01
15	HP-HT fluid loss apparatus	01
16	Magnetic Stirrer with Hot Plate	01

b. SPECIMEN TABLE FOR MUD PARAMETERS TESTING CAPABILITY OF LBORATORY:

The testing facility for mud shall be capable of testing for the following mud parameters. Accordingly successful bidder shall indicate all the applicable mud parameters in the mud programme proposed (meeting to OIL's requirement) to be submitted for each stage of drilling prior to commencement of operation and, shall report the parameters, as applicable during the currency of well operation,

a) Mud Density	b) Funnel Viscosity
c) Plastic Viscosity.	d) Yield Point.
e) Gel Strength.	f) RPM (3, 6, 100, 200, 300, 600)
g) API Filtration Loss	h) Oil content
i) Solid Content	j) Sand %
k) pH	l) Salinity
m) MBC	n) HPHT Filtrate Loss @150 ^{0}C/ 500 PSI.
o) Potassium ion test	p) Metal Concentration, if applicable.
q) Total Hardness as Ca^{2+} and Mg^{2+}	r) Mud Alkalinity (Pf/Mf)
s) Lubricity Coefficient	t) PHPA/Polyamine Tests

4.6 In case any item/ equipment is proposed to be imported for the purpose of execution of this contract, the details thereof must be furnished in the prescribed format as asked for in this bid document.

4.7 Bidder shall keep sufficient quantity and volume measurement types for glass wares which includes but not limits to graduated cylinder (10ml/25ml/ 50ml/250ml), conical flasks (50ml/ 250ml), beaker (200ml/100ml), round bottom flask (250ml),

volumetric pipette (10ml), graduated pipette (1ml/ 2ml/ 10ml), burette, pipette stand, burette stand, glass thermometer, stirring rod etc, for trouble free and smooth testing of mud parameters.

5.0 MUD AND MATERIAL MANAGEMENT SERVICES:

i. Bidder shall ensure that sufficient quantities of materials and Chemicals shall be available to allow for a smooth, uninterrupted operation, bidder shall also provide actual delivery verification.

ii. The Bidder shall provide copies of daily progress report inclusive of drilling fluid hydraulic generated with the help of suitable software package to the OIL representative. The report should also incorporate drilling operations, complete mud parameters analysis, chemicals consumed, volume of mud prepared and loss of mud and operation of solid control equipment as per standard practices.

iii. Literature and details of software package for mud hydraulics, hole cleaning and engineering shall also be provided by the bidder.

iv. Bidder shall provide details of Mud Engineering programs, including completion fluid design for the proposed well prior to commencement of well.

v. Bidder shall submit details mud Engineering program for the well at least three weeks prior to commencement of well. The program shall include but not limited to the following: -

   a) Detailed mud program for each section.
   b) Mud Parameters for each section.
   c) Chemicals proposed for curing losses and releasing pipe stuck and for other drilling fluid related down hole complications with detailed procedures.
   d) Based on the performance of mud systems, the bidder shall undertake suitable studies for improving the performance of the mud system and shall submit the recommendations time to time to OIL's representatives.
   e) Software and Technical support:

Bidder shall provide technical support for customers and onsite Engineer along with a suite of software product suitability in the range of included data-based program to the proprietary package of drilling fluid management, advanced drilling fluid Engineering, environment program and reference data base containing at least technical literature and product summaries. Bidder shall provide higher technical support and back up whenever required by field personnel.

6.0 LEFTOVER CHEMICALS AND ADDITIVES

6.1 The Bidder shall lift the unused / left over Chemicals after completion of the contract from the well site within 15 days from the intimation about the same at their own cost.

6.2 The Company shall not buy any leftover mud chemicals/additives, or any consumables brought by the Contractor. It would be the responsibility of the Contractor to re-export or dispose-off the left over Chemical and additives, as deemed fit, in accordance with existing regulations.

7.0 SAFETY, HEALTH AND ENVIRONMENT

Bidder shall ensure safe conditions and methods of work and maintained the same throughout the period of contract. Bidder shall carry out all the activities in accordance with the highest international standards practices of the oil and gas Industries, ensure safe conditions and methods of work and maintained the same for the entire period of contract.

7.1 Bidder shall comply with the applicable environmental law, regulations, and practices, and is required to perform work to minimize the generation of hazardous waste to the extent technically feasible.

7.2 Bidder shall comply with and shall ensure the Bidder personnel comply with the OIL requirements in relations to its weapons, alcohol, and drug free policy as-

a) Alcohol and drugs, except those prescribed by qualified medical practitioner, are prohibited from the worksite.

b) Bidder shall ensure that any Bidder personnel who are either temporarily or permanently taking drugs under medical supervision are able to produce to OIL on request an appropriate letter from the recognized medical practitioner. Such individuals shall be immediate on arrival to the workplace report to the Medical Officer or if not available, Oil representative and lodge with them a copy of their medical practitioner's letter.

c) Bidder/Bidders shall obey all local rules, regulations and custom pertaining to Alcohol and drugs prevailing in the country where the work is to be performed.

d) Any person reporting to work either under or appearing to be under the influence of alcohol or drugs shall not be allowed to commence work or travel to worksite. Bidder shall be responsible for all costs relating to the replacement of such persons.

e) Bidder shall provide OIL representative with copies of any report or statements or written evidence incident or dangerous events which occurs during the performance of work or any other incident indicating the existence of adverse safety conditions of which Bidder personnel may become aware.

f) Bidder shall supply with the copies of all reports and documents regarding safety matters upon request by OIL as it is required by Legislation to Comply or maintain together with such other reports as OIL may require.

g) Bidder shall provide appropriate protective clothing where necessary for the protection of Bidder personnel whilst performing the work.

h)

7.3 SAFETY HEALTH AND ENVIRONMENT

The Bidder shall in connection with the work hereunder.

7.3.1 Protect environment resources by applying best available techniques to eliminate or minimize any direct or indirect impact from operations.

7.3.2 Ensure that all activities are planned in a manner that will not create unnecessary danger, disturbance, or effects on the environments or to other users.

7.3.3 Ensure that all the Chemicals and formulation used under this contract comply with any corporation standards and/or Legislation concerning the Environment in the location where the work is to be carried out.

7.3.4 Ensure that all persons affected or likely to be affected by executions of the work are not exposed to the substances or agents which may give rise to adverse health effects. Bidder shall ensure that all Bidder personnel are fully trained in appropriate control measures to be implemented, have been provided with, and use the correct personal protective equipment.

7.3.5 Ensure that notice is given to OIL with the reasonable time prior to the delivery or removal from the work site of any substance which is Toxic and Hazardous to Health or potentially harmful to the Environment. The notice shall identify the hazards and affect and assess the risk to personnel and the environment. Details of precautions to be taken when using, handling, transportation, storing

or any other means of contact will also be provided. Bidder shall ensure that the substance is suitably packaged11.

7.3.6 Make available for all inspection by OIL upon request all registers, records or any other documentary or environmental aspects of the activity being carried out or on the environmental management system implemented by Bidder.

7.3.7 Bidder shall Prepare and maintain a plan documentary requirements, responsibilities, and organization for environment management. The plan should be readily understandable by all personnel and shall cover routine, non-routine and emergency operations and be agreed in advance with OIL.

7.3.8 If applicable, ensure that prior to the commencement of work all Companies, Organizations and Communities that could potentially be affected by the activity have been notified:

7.3.9 Unless otherwise directed by OIL, avoid conducting activities in protected areas or where there is intolerable risk of damage to the sensitive environmental resources.

7.3.10 Document and report immediately to OIL any incident of Environment damage, any unforeseen activity or event, released of Hydrocarbons, breaches of Environmental regulations or complaint from local groups, Organizations or individuals.

7.3.11 Where Bidder is responsible for disposal of waste produced or occurring because of its activities under the Contract, all such disposals shall be in accordance with the OIL Industries standards, Legislation and best practices wherever same is applicable for Hazardous and non-hazardous waste. Bidder/Bidder shall be responsible for ensuring all necessary approvals or licenses are obtained and that any sub-Bidders utilized for this purpose shall fully comply with the requirements.

7.3.12 Maintain a logbook where in the waste generated from the mud system is recorded.

7.3.13 Selected bidder shall provide toxicity report for the mud system of each stage of drilling which should comply with the toxicity limits as per guidelines of Central pollution control board and/or State pollution control board**.**

8.0 REPORT GENERATION (MUD ENGINEERING DATA & HYDRAULICS):

8.1 Bidder shall comply with the following minimum reporting requirements. Bidder shall also provide additional report to the OIL representative as may be requested during the work.

8.2 Provide daily mud reports to Company representative at base/rig.

8.3 End of Well Recap: A detailed well completion report shall be prepared and submitted within 30 days of completion of the well.

8.4 Complication Report. In-case of any complications, such as pipe stuck, loss circulation, Well Kick, unusual caving, undesirable cutting bed formations etc. The onsite Mud Engineer of the bidder shall notify the OIL Chemist immediately. A detail draft report shall be submitted by the bidder, within 24 Hours of the incident (Operation permitting), with full details and reason of the same and remedial measures / recommended that shall be followed to ensure safe and complication free drilling.

9.0 LIST OF CHEMICALS AND SPECIFICATIONS

The list of chemicals proposed to be used during drilling the wells at Tripura are as given under.

TABLE-I: LIST OF CHEMICALS AND ADDITIVES

Sl. No	Name of Functional Chemical	Brand Name	Country of Origin SAC/HSN	MSDS
1	Bentonite			
2	Caustic Soda			
3	Barytes			
4	CMC (High viscous grade)			
5	CMC (Low viscous grade)			
6	PAC -R			
7	PAC-L			
8	Linseed Oil			
9	EP-Lube			
10	Shale Stabiliser			
11	Encapsulating Polymer			
12	XC-Polymer			
13	Accretion Inhibitor (Drilling Detergent)			
14	Glycol/Polyol			
15	Calcium Carbonate (MCC)			
16	Formalin/ Biocide			
17	Octyl Alcohol/ Defoamer			
18	Sodium Formate			
19	Mica			
20	Cellophane flakes			
21	Saw Dust			
22	Wall Nutshell (Medium)			
23	Oxygen Scavenger			
24	Pipe Lax/ Spotting Fluid			
25	H2S Scavenger			
26	Sodium Bicarbonate			
27	Teepol			
28	Acid Sodium			
29	Corrosion Inhibitor (Amine Based)			
30	Soda Ash			
31	Potassium Sulphate			
32	NIF			

A. SPECIFICATION OF SOME CHEMICALS

As provided in the list of chemicals above, approximately 34 chemicals will be used during drilling operation. Contractor has to maintain the API/ OIL specification for all chemical. However, for better understanding of the standard of quality control measures to be followed during the course of operation, technical specification of

some important chemicals are given below. Samples of chemicals when collected at the well site for quality testing must conform to these specifications.

i. **BENTONITE:**
Specification:

1. **Physical Properties**: The material as received should be in the form of fine light to greyish yellow buff or cream coloured powder, free from dirt and foreign matter.

2. Moisture Content, measured by drying at 105 +/- 2DegC to constant weight, % by mass, maximum. : 12.00

3. Sand Content, % by mass, max. : 2.00(retention on 200 B.S.S. mesh sieve or equivalent, by wet method).

4. Dry Screen Analysis, % by: 98.00 mass, min (passing through 100 B.S.S. mesh or equivalent by dry method).

5. **Performance Test**: Prepare a Bentonite suspension by mixing 7.5 gms of Bentonite per 100 ml distilled water. Stir the suspension in a multimixer for 15 minutes so that no lumps are left in the suspension after the stirring period. Age the suspension for 24hrs at 26 +/- 2 degC. After lapse of the aging period, stir the suspension for 15 minutes in a multimixer and then determine apparent viscosity, plastic viscosity and API fluid loss of the suspension at 26 +/- 2 deg C which should be as follows.

   (i) Apparent viscosity, cp, min. : 15,
   (ii) Plastic viscosity, cp, min. : 6
   (iii) API fluid loss, ml, maximum : 20

6. **Packing**: The material should be packed in new HDPE bags or moisture proof polythene lined (100 gauge) D.W. jute bags (9oz) strong enough to withstand rigorous of transit and storage. Capacity 50 Kgs. Net per bag.

7. **Markings**: Each bag should have clear legible markings as given bellow:
   i) Name of the product.
   ii) Name of the supplier/manufacturer.
   iii) Date/Month/Year of manufacture.

ii. **BARYTES:**

Specification

1. **Physical Properties:**
The material as received shall be white/light greyish white/light pinkish white free flowing powder, free from dirt and foreign matter.

2. Specific Gravity of material, as received, at 26 +/- 2 degC minimum: 4.15

3. **Fineness:**
   (a) Wet Screen Analysis – Passing through 75 micron sieve, (ISS 6/BSS 200/ASTM 200), %by mass, minimum: 97.00
   (b) Passing through 53 micron sieve, (ISS 5/ BSS 300/ASTM 270, % by mass: 90 +/-5

4. Insoluble Minus Silica % by mass, minimum: 90.00

5. Water Soluble Content, % by mass, maximum: 0.02.

6. **Performance Test:** Prepare a Bentonite suspension by mixing 7.5 gm of OIL / API approved Bentonite per 100 ml distilled water, Stir the suspension in a multimixer for 15 minutes so that no lumps are left in the suspension after the stirring period. Age the suspension for 24 hrs at 26 +/- 2 degC. After the lapse of the aging period, adjust the apparent viscosity of the suspension in the range of 15-20 cps with distilled water if necessary. Load the suspension with the Barytes sample as received, to 1.60 sp.gravity weight and stir in multimixer for 10 minutes. Measure apparent viscosity of mud so prepared at 26 +/- 2 degC. This should be as follows.

Apparent Viscosity, cp, maximum: 60.

N.B. Apparent viscosity to be measured by a Fann VG meter.

7. **Packing:** The material should be packed in brand new Double-Walled (DW) jute bags (9 Oz) with single polythene lining (100 gauge) or brand new HDPE bags strong enough to with stand rigorous of transit and storage. Capacity: 50 Kilogram (new) per bag.

8. **Markings:** Each bag should have clear legible markings as given bellow:

i) Name of the product.
ii) Name of the supplier/manufacturer.
iii) Date/Month/Year of manufacture.

iii. **CARBOXY METHYL CELLULOSE, CMC (HVG):**
Specification

1. **Physical State:**
The material as received should be white to creamish coloured free flowing powder and free from lumps and visible extraneous impurities.

2. Moisture Content Measured by drying at 105 +/- 2 degC, % by mass, maximum: 10.00

3. Sodium Carboxy Methyl Cellulose content on dry basis, % by mass, minimum. : 55.00

4. Yield of 15 cp Apparent Viscosity Suspension: Prepare a 15cp apparent viscosity suspension of the sample by stirring in a multimixer for 30 minutes in distilled water and 3.5% salt water (prepared by dissolving 3.5 gram LR grade NaCl in 100 ml distilled water) and, calculate the yield of the sample which should be as follows:

a) Yield in distilled water, KL/MT,min. : 200
b) Yield in salt water, KL/MT, min. : 120

5. **Packing:** The material should be packed in moisture proof multiply (minimum5 ply) strong paper bags enough to withstand the rigorous of transit and storage. Capacity: 25 kg net per bags.

6. **Marking**: Each bag should have clear legible markings as follows:

i)Name of the product
ii) Name of the supplier

iii) Date/Month/Year of manufacture

N.B.: Apparent viscosity to be measured by a Fann VG meter.

iv. **SODIUM HYDROXIDE (CAUSTIC SODA)**

Specification:

1. **Physical properties**: The material, as received, should be in the form of flakes and should be free from dirt and foreign matter.

2. Purity as NaOH, as received, % by mass (minimum): 95.00.

3. **Packing**: The material should be packed in moisture proof HDPE bag with an insert of 300 gauge polythene bag and strong enough to with stand rigorous of transit and storage.

4. The material should be supplied in the original packing of manufacturer. Capacity 25 kg / 50 kg net per bag.

5. **Marking**: Each bag should have clear legible markings as givenbelow:

i) Name of the product.
ii) Name of the supplier.
iii) Date/month/year of manufacture.

v. **POLYANIONIC CELLULOSE REGULAR GRADE (PAC-R):**

Specification:

1. **Physical Properties:** The material, as received, should be a free flowing white to creamish / brownish white powder free from foreign matter and visible impurities.

2. Moisture Content at 105 +/- 2 Deg C, % by mass, maximum: 15.00

3. Apparent viscosity of 1.0 % (w/v) suspension of the material as received in fresh water and 4% salt water. Prepare a 1 % (w/v) suspension of the sample by stirring in multimixer for 30 minutes in distilled water and, 4 % salt water(prepared by dissolving 4 gm of LR grade NaCl in 100 ml (distilled water)and measure apparent viscosity at 26 +/- 2 degC by Fann VG meter.

(i) Apparent viscosity in fresh water, cp : 75-100
(ii) Apparent viscosity in salt water, cp : 65-85

4. Yield of 15 cp apparent viscosity suspension:
Prepare a 15 cp apparent viscosity suspension of the sample stirring in a multimixer for 30 minutes in distilled water and 4 % salt water (prepared by dissolving 4 gm of LR grade NaCl in 100ml distilled water) and calculate the yield of the sample which should be as follows.

(i) Yield in distilled water,KL/MT, min. : 250
(ii) Yield in 4 % salt water KL/MT, min. : 200

5. Sodium Carboxy Methyl Cellulose Content, % by mass (dry basis), minimum: 85.00

6. Degree of Substitution, minimum: 1.00

7. **Performance Test** :

A. In Fresh Water mud.

(i) **Preparation of base mud.**
Prepare a 10 % (w/v) suspension of OIL / API approved Bentonite in distilled water and stir the suspension for 15 minutes in a multimixer so that no lumps are left after the stirring period. Age the Bentonite suspension for 72 hrs at 90 +/- 2 degC. After the lapse of the aging period, cool and adjust apparent viscosity in the range 15-20 cp with distilled water. Also adjust pH in the range 9.0-9.5 with 10 % NaOH solution, if necessary. Stir the suspension for 15 minutes in multimixer and determine apparent viscosity, yield value and API fluid loss of the suspension at 26 +/- 2 DegC which should be as follows:

(a) Apparent viscosity, cp : 15 – 20 cp.
(b) Yield value,lbs/100 ftsq: To determine
I API fluid loss, ml : To determine

(ii) **Preparation of treated mud:**
Treat the base mud as per 7A (i) with 0.5% polyanionic cellulose I sample. Stir in a multimixer for 30 minutes and divide the mud into two parts.
Performance at 26 +/- 2 Deg C. Measure apparent viscosity, yield value and API fluid loss of one part of treated mud 7A (ii) at 26 +/- 2 degC which should be as follows:

(a) Apparent viscosity, cp minimum. : 4 times of 7A(i,a)
(b)Yield value, lb/100 ftsq. Minimum : 4 times of 7A(i,b)
I API fluid loss, ml maximum. : 40 % of 7A(i,c)

Performance at 120 +/- 2 Deg C.: Age second part of treated mud 7A (ii) at 120 +/- 2 DegC in rolling condition for 24 hrs. After aging, cool to 26 +/- 2DegC and stir in a multimixer for 15 minutes and determine apparent viscosity, yield value and API fluid loss of the mud at 26 +/- 2 DegC which should be as follows:

(i) Apparent viscosity, cp minimum. : 3 times of 7A(i, a)
(ii) Yield value,lb/100 sq.ft minimum. : 3 times of 7A (i,b)
(iii) API fluid loss, ml, maximum. : 40 % of 7A (i,c)

B. In Salt Water Mud *:*

(i) **Preparation of base mud:**
Prepare 10 % (w/v) Bentonite suspension of OIL / API approved Bentonite in distilled water and stir the suspension for 15 minutes in a multimixer so that no lumps are left after the stirring period. Age the suspension for 72 hrs at 90 +/- 2 degC. After the lapse of aging period, cool and add 4% (w/v) NaCl (LR grade) and age for 24 hrs at 26 +/- 2 degC. Dilute the suspension with 4 % Nacl solution and adjust apparent viscosity in the range 15-20 cp. Adjust pH in the range of 9.0-9.5 with 10% NaOH solution if necessary. Determine apparent viscosity, yield value and, API fluid loss of the suspension at 26 +/- 2 degC which should be as follows:

(a) Apparent viscosity, cp : 15 – 20
(b) Yield value, lbs/100 ft sq. : To determine
I API fluid loss, ml : To determine

Treat the base mud prepared as per the 7B(i) with 0.5%(w/v) polyanionic cellulose I sample and stir in a multimixer for 30 minutes.

Performance at 26 +/- 2 degC. Determine apparent viscosity, yield value and, API fluid loss of mud 7B(ii) above at 26 +/- 2 DegC which should be as follows:

(a) Apparent viscosity, cp minimum. : 2 times of 7B (i,a)
(b) Yield value, lb/100 ftsq minimum. : 1.5 times of 7B (i,b)
I API fluid loss, ml maximum : 15 % of 7B(i,c)

8. **PACKING** : The material should be packed in multiwalled paper bags with at least two innermost layers suitably water-proofed, strong enough to withstand rigorous of transit and storage. The material should be supplied in the original packing of the manufacture. Capacity 25 Kg net per bag.

9. **Marking:** Each bag should have clearly legible markings as given below:
(i) Name of the product.
(ii) Name of the supplier / manufacturer.
(iii) Date/Month/Year of manufacture.

N.B:
1) Apparent viscosity and yield point to be determined by a Fann VG meter and fluid loss by standard API low pressure fluid loss apparatus using compressed air or, nitrogen as the pressure source.

2) The Supplied Materials must meet OIL's specifications in all respect.

12.6 XC POLYMER- DISPENSIBLE (XCD)

Specification:

1. **Physical Properties:**
The material, as received, should be a free flowing white to creamish / brownish white powder free from foreign matter and visible impurities.

2. Moisture Content, measured by drying at 105 +/- 2 degC, % by mass, maximum: 15.00.

3. Dispersibility / Solubility Test:
The material should be quickly and easily dispersible in water when sprayed in water taken in breaker and should not remain floating. 1.00% (w/v) solution of the product in distilled water after mixing in multimixer for 30 minutes should give clean solution without turbidity.

4. **Rheological properties:**
Prepare a 0.5% (w/v) solution of the sample in distilled water containing 1% (w/v) NaCl (LR grade) by stirring in a multimixer for30 minutes. Adjust pH of the solution in the range 8 – 9 by addition of 1N NaOH solution while stirring. Determine the rheological properties of the suspension at 26 +/- 2 degC which should be as follows:

(i) Apparent viscosity, cp : 15 – 25
(ii) "0" minute gel, lbs/100 ft sq, minimum: 8
(iii)"N" value at 200 & 100 rpm of Fann VG meter or equivalent, maximum. 0.405.

5. **Cross linking properties:**

To 500 ml of distilled water, add 5 ml of 3% (w/v) solution of Calcium Chloride (fused and analar grade) and to this solution, add 0.5% (w/v) of the sample while stirring in a multimixer. Stir the suspension further for 30 minutes in a multimixer. To this add 2% (w/v) chrome alum powder (LR grade) and stir for additional 10 min. Adjust the pH in the range 8-9 by 1N NaOH solution while stirring. Determine the rheological properties of the suspension at26 +/- 2 degC which should be as under:

(i) Apparent viscosity, cp, minimum: 40
(ii) Yield value, lbs/100 ftsq,minimum: 40
(iii) "0" minute gel, lbs/100ftsq, minimum: 20
(iv) "15" minute gel, lbs/100 ftsq, minimum: 100

6. **Performance Test:**
Prepare a 0.5% (w/v) solution of the sample in distilled water by stirring in a multimixer for 30 minutes. Adjust the pH to 8 – 9 with1N NaOH solution. Add to it 3% of the OIL / API approved Betonite powder and stir for 30 minutes. Determine apparent viscosity, yield value and API fluid loss of the mud at 26 +/- 2 degC.

(i) Apparent viscosity, cp: To determine
(ii) Yield value, lbs/100 ftsq : To determine
(iii) API fluid loss, ml: To determine

Age the treated mud at 100 +/- 2 degC for 18 hrs in rolling condition. Cool and stir for 15 minutes in a multimixer. Determine apparent viscosity, yield value and API fluid loss at 26 +/- 2 degC which should be as under:

(i) Apparent viscosity, cp: should not decrease
(ii) Yield value, lbs/100 ftsq : should not decrease
(iii) API fluid loss, ml: should not increase

7. **Temperature stability:**
Prepare 0.5% (w/v) solution of the sample in saturated salt water (prepared by dissolving analar grade NaCl in distilled water) by stirring in a multimixer for 30 minutes. Adjust PH to 8 – 9 by 1NnaOH solution. Record apparent viscosity and yield value of suspension at 26 +/- 2 degC.

(i) Apparent viscosity, cp: To determine
(ii) Yield value, lbs/100 ftsq: To determine

Age the solution in a roller oven in rolling condition at 120 +/- 2degC for 18 hrs. Cool and stir for 5 minutes. Measure apparent viscosity and yield value of the solution at 26 +/- 2 degC which should be as under:

(i) Apparent viscosity, cp: should not decrease
(ii) Yield value, lbs/100 ftsq: should not decrease

8. **Borate Sensitivity Test:**
Prepare a 0.5% (w/v) solution of the sample in distilled water by stirring in a multimixer for 30 minutes. Add to it 5 ml of 20% (w/v) hot solution of borax and stir for 5 minutes. No stiff gel formation should take place.

9. **Packing:**
The material should be packed in multi walled paper bags with at least two innermost layers are suitably water proofed strong enough to withstand rigorous of transit and storage. Pack Size: 25KG net per bag.

10. **Markings:**
Each bag should have clear legible markings as given below:

(i) Name of the product/brand name
(ii) Name of the supplier/manufacturer (Name of manufacturer must be marked on the bags in case the product is not branded).
(iii) Date/month/year of manufacture

N.B.
1) Apparent viscosity and yield value to be measured by a Fann VG meter or equivalent and API fluid loss to be measured in standard API fluid loss apparatus using compressed air or nitrogen as pressure source.

2) The Supplied Materials must meet OIL's specifications in all respect.

12.7 **Carboxy Methyl Cellulose (Low Viscosity Grade)**
Specification:

1. **Physical Properties:** The material, as received, shall be white to creamish white free flowing powder free from dirt and foreign matter.

2. Moisture Content, measured by drying at 105 +/- 2 deg C. (%by mass), maximum. : 10.00

3. Apparent viscosity of 2 % (w/v) suspension of the material as received, in distilled water at 6 +/- 2 degC, cp, maximum: 30.00cp

4. Dry sieve analysis, retained in 8 BSS or equivalent mesh, % by mass: NIL

5. Degree of substitution minimum: 0.70

6. Sodium carboxymethyl Cellulose content, on dry basis, % by mass, minimum. : 55.00

7. **Performance Test:**

(a) **Preparation of base mud:** Prepare a Bentonite suspension by mixing 7.5 gm of OIL / API approved Bentonite per 100 ml of distilled water using a multimixer. Stir the suspension for 15 minutes so that no lumps are left after the stirring period. Age the suspension for 24 hrs at 26 +/- 2 degC. After the lapse of the aging period, stir the suspension again for 15 minutes in multimixer and measure apparent viscosity and API fluid loss of the suspension at 26 +/- 2 Deg C which should be as follows:

(i) Apparent viscosity, cp, minimum. : 15
(ii) API fluid loss, ml: 20 +/- 1

(b) **Preparation of treated mud:** To the above Bentonite suspension prepared in 7(a), add 0.5 % of the CMC (LVG) sample (w/v), as received and stir in a multimixer for 30 minutes. Measure apparent viscosity and API fluid loss of this CMC (LVG) treated mud at 26+/2 degC which should be as under.

(i) Apparent viscosity, cp, max. : 2.5 times of 7(a)(i)
(ii) API fluid loss, ml, max. : 40% of 7(a)(ii)

8. **Packing:**

The material should be packed in moisture proof multiply (minimum 5 ply) paper bags strong enough to withstand rigorous of transit and storage. Capacity 25 kg net per bag.

9. **Markings:**
Each bag should have clear legible markings as given below:

(i) Name of the product
(ii) Name of the supplier
(iii) Data/month/year of manufacture

N.B. Apparent viscosity to be measured by a Fann VG meter and API fluid loss to be measured in standard API fluid loss apparatus using compressed air on nitrogen as pressure source.

12.8 **PHPA (Partially Hydrolysed Polyacryl Amide)**
Specification

1. **Physical Properties:** The material, as received, should be a free flowing white powder free from lumps and other impurities.

2. Moisture Content, measured by drying at 105 +/- 2 degC, % by mass, maximum. : 7.00

3. **Ionic character**: Anionic

4. **Relative CST value (capillary suction test)**
(i) At 0.1% (w/v) polymer conc., min : 100
(ii) At 0.2% (w/v) polymer conc., min : 200

5. Relative dispersibility at 0.2% (w/v) polymer conc. At 60+/- 5Deg C, max: 175

6. Degree of hydrolysis: 20-40 %(electrometric titration)

7. Apparent viscosity of 0.2% (w/v) polymer solution in distilled water.
(i) At 26 +/- 2 deg C, cp, minimum: 9
(ii)After aging at 110 degC for 18 hrs. : Should not decrease more than 20% of (i)

8. Effect on 4 cp Bentonite suspension: Prepare a 7.5% (w/v) Bentonite suspension in distilled water and stir in a multimixer for15 minutes so that no lumps are left after the stirring period. Age the suspension at 26 +/- 2 degC for 24 hrs. Prepare a 4 cp Bentonite suspension from it by dilution with distilled water. Add to it 0.2% (w/v) of powdered PHPA sample and stir for 30 minutes in multimixer. Adjust pH of the suspension to 9.0 using caustic soda solution. Measure apparent viscosity at 26 +/- 2 degC.

(i) Apparent viscosity should be 15 cp minimum

Age the suspension at 110 deg C for 24 hrs in rolling condition. After the aging period cool and stir for 15 minutes in multimixer. Measure apparent viscosity of the suspension at 26 +/- 2 degC.

(ii) Decrease of apparent viscosity 20% max. of 8(i)

9. Calcium tolerance: Prepare a 0.4% (w/v) suspension of thePHPA sample in distilled water by stirring in a multimixer for 15 min.

(i) Record apparent viscosity of the PHPA solution.

Prepare again a 0.4% (w/v) suspension of the PHPA sample in100 ppm Calcium solution by mixing in a multimixer. Measure apparent viscosity of the solution.

(ii) Apparent viscosity should be 60% minimum of 9(i)

10. **Packing:** The material should be packed in multiwall paper bags with at least two innermost layers suitably water proofed, strong enough to with stand rigorous of transit and storage. Capacity 25 kg net per bag.

11. **Markings** – Each bag should have clear legible markings as given below:
(i) Name of the product
(ii) Name of the supplier

N.B. Apparent viscosity will be measured by a Fann VG meter

12.9 **PIPE LAX:**
Specifications:

1. **Physical State:**
The material shall be homogeneous free flowing liquid at 24 ± 2 degC, free from visible impurities.

2. Miscibility with HSD Oil: Completely miscible.

3. Interfacial Tension of Distilled Water – HSD Oil containing 2.5% (w/v) Spotting Fluid, dynes /cm: 13 (Maximum)

4. Lubricity Coefficient of treated Bentonite Suspension: A Bentonite Suspension (prepared by dilution of Prehydrated Bentonite with Distilled Water) having Apparent Viscosity of 15 cp is treated with 1% (w/v) of the Additive and its Lubricity Coefficient is measured on a Lubricity Tester:
Lubricity Coefficient of the treated Bentonite suspension should not be more than 0.11.

5. **Mud Cake Cracking Test:** Prepare a Bentonite Suspension having Apparent Viscosity 15 cp by diluting Bentonite gel (pre-hydrated at 90 ± 2 degC for 72 hours) with Distilled Water and load it to Specific Gravity 1.20 with Barytes. Obtain a Filter Cake of this Mud in the API Filter Loss Apparatus by carrying out filtration for 30 minutes at 100 psi pressure (use Whatman No. 1filter paper). Throw the Mud away, wash the Mud Cake with a slow stream of water without removing the Mud Cake from the Cell and fill the Cell with 100 ml HSD oil containing 2.5% (w/v) Spotting Fluid. Apply 100 psi pressure, after closing the Cell and determine the Time required for collection of 100 ml filtrate. Filtration time should not be more than 50 minutes.

6. **Sticking Test:** Prepare loaded Bentonite Suspension of Specific Gravity 1.20 as in the case of Mud Cake Cracking Test and fill it in a Sticking Tester. Form a Filter Cake by applying 500psi pressure for 30 minutes. Stick the plate by pressing it on the cake for 5 minutes and leave for 1 hour under 500 psi pressure. Then release the pressure, drain off Mud from the cell by opening the bottom and top stoppers. Replace the bottom stopper and fill the cell with 100 ml of HSD Oil containing 2.5% (w/v) of the Sample of Spotting Fluid. Close the top stopper and again apply500 psi pressure.

Note the time for release of stuck plate and if not released in 20 minutes, apply torque with a Torque Wrench.
The time required to release the stuck pipe if the plate gets released within 20 minutes

OR
Torque required for release of the stuck plate should not be more than 65 inch-pounds.

8. **Packing:** The material should be packed in 50 litre capacity leak proof HDPE carboy with leak tight stopper and screwcaps.

12.10 **EXTREME PRESSURE MUD LUBRICANT**
Specifications:

1. **Physical Properties:** The material, as received, should be yellow, brownish yellow, pinkish yellow coloured clear viscous liquid free from suspended materials and other impurities. The material should be vegetable oil based product, non-polluting, bio-degradable, non-fluorescent and should be environmentally friendly product and should yellow, brownish yellow, pinkish yellow coloured clear viscous liquid free from suspended materials and other impurities. The material should be vegetable oil based product, non-polluting, bio-degradable, non-fluorescent and should be environmentally friendly product and should not cause any pollution hazard.
The product should not be produced from petroleum oil and should not produce oil sheen in water.

2. **Miscibility/ Dispersibility:** The material should be dispersible/miscible with water without formation of oil sheen in water.

3. Density at 26 +/- 2 degC, gm/ml: 0.92 – 0.98

4. Performance Test:

A. **Lubricity Test:**

(i) **In fresh water mud:**
Prepare a 7.5% (w/v) Bentonite suspension in distilled water using OIL / API approved Bentonite and stir for 15 minutes in multimixer so that no lumps are left after the stirring period. Age the suspension for 72 hrs. at 90 +/- 2 degC. After the lapse of aging period, adjust apparent viscosity of the suspension to 15 +/-1 cp by dilution with distilled water. To this, add 0.5%(w/v) of the sample while stirring. After completion of addition, sir further for 30minutes in a multi- mixer. Measure lubricity co-efficient by using alubricity tester. Lubricity co-efficient should not be more than 0.15.

(ii) **In saline water mud** –
Prepare a 10% (w/v) Bentonite suspension in distilled water using OIL / API approved Bentonite and stir for 15 min. in multimixer so that no lumps are left after the stirring period. Age the suspension for 72 hrs at 90 +/- 2 degC. After lapse of aging period, add 4% NaCl (w/v) (AR grade) and stir for 15 minutes in a multimixer. Age the suspension for24 hrs. at 26 +/- 2 degC. Adjust the apparent viscosity to 15 +/- 1 cp by dilution with 4% NaCl solution, if necessary. To this saline mud, add 0.50%(w/v) of the sample in stirring condition and stir further for 30 minutes in a multimixer. Measure lubricity co-efficient by using a lubricity tester.

Lubricity co-efficient should not be more than 0.20

B. **Extreme pressure lubrication test:**
(i) **In fresh water mud** – Prepare a 7.5% (w/v) Bentonite suspension in distilled water using OIL / API approved Bentonite and stir for 15 minutes in multimixer so that no lumps are left after the stirring period. Age the suspension for 72 hrs. at 90 +/- 2 degC. After the lapse of aging period, adjust apparent viscosity of the suspension to 15 +/- 1 cp by dilution with distilled water and filter through200 mesh BSS mesh or equivalent sieve. Add 0.5% (w/v) of the sample to the Bentonite suspension while stirring. After completion of addition, stir again in the multimixer for 30 min. Determine the film strength of the mud at 300 in-lb load with the help of a E.P. lubricity tester.
The film strength should be 25,000 psi, minimum.

(ii) **In saline water mud** – Prepare a 10% (w/v) Bentonite suspension in distilled water using OIL / API approved Bentonite and stir for 15 min. in multimixer so that no lumps are left after the stirring period. Age the suspension for 72 hrs at 90 +/- 2 degC. After lapse ageing period, add 4% NaCl (w/v) (AR grade) and stir for 15 minutes in a multimixer. Age the suspension for 24 hrs. at 26 +/- 2 degC. Adjust the apparent viscosity to 15 +/- 1 cp by dilution with 4% NaCl solution, if necessary and filter through 200 BSS mesh or equivalent mesh. Add 0.5% (w/v) of the sample while stirring and stir further for 30 minutes in multimixer. Determine the film strength of the mud at 300 in-lb load with the help of a E.P. lubricity tester.
The film strength should be 20,000 psi, minimum.

5. **Foam Test:**
Prepare a 7.5% (w/v) Bentonite suspension in distilled water using OIL / API approved Bentonite and stir for 15 min. in multi-mixer. Age the suspension for 24 hrs. at 26 +/- 2 degC. Adjust the apparent viscosity of the suspension to 15 +/-1 cp by dilution with distilled water. Add 0.5% (w/v) of the sample to it and stir for 30 minutes in a multimixer. Determine the specific gravity of the mud. The specific gravity of the mud should not be less than 0.8.

6. **Packing:**
The material should be packed in 50 litre capacity leak proof HDPE car buoys with leak tight topper and screw caps. Capacity 50 litre net per carbuoys.

7. **Markings:**
Each carbuoys should have clear legible markings as given below:
(i) Name of the product
(ii) Name of the supplier
(iii) Date/month/year of manufacture

N.B. Apparent viscosity will be measured by a Fann Vgmeter and lubricity should be measured by a E.P.lubricity tester.

12.11 **DRILLING DETERGENT:**
Specification:

1. **Physical properties:** The material, as received, should be soapy liquid, miscible with water. It should be free from visible impurities and any other suspended matter.
Should be determined visually

2. Density at 25 degC, gm/ml: 1.00 – 1.10,

3. Surface Tension of 0.25% (v/v) solution of the sample in distilled water at 25 degC, dynes/cm., maximum: 35.00

4. pH of 1 % (v/v) solution : 7.5 – 10.5 of the sample in distilled water.

5. **Emulsion Stability Test:** To 485 ml of distilled water, add 15 ml of HSD oil slowly while stirring in a multimixer and then add to it 1 ml. of the sample. Stir further for 15 minutes in the multimixer for formation of emulsion. Transfer the contents to 500 ml. measuring cylinder and observe phase separation of the mixture which should be as follows. :

(i) Immediate separation of HSD oil should be nil.
(ii) Separation of HSD oil after 24 hrs. at room temperature should not be more than 5 ml.

6. **Mud Lubricity Coefficient**: Prepare a 10 cp Bentonite suspension by dilution of prehydrated Bentonite suspension (OIL / API approved Bentonite) and treat it with 0.5 %(v/v) of the sample and stir it for 15 minutes in a multimixer. Determine lubricity coefficient of the suspension in a lubricity tester. Lubricity co-efficient should not be more than 0.20

7. **Foaming tendency test:** Prepare 0.10% (v/v) solution of the sample in distilled water Stir the solution for 10 minutes in a multimixer. Transfer the content immediately to a measuring cylinder. Allow it to stand for 15 minutes and then measure the total volume of content along with foam. Calculate percent increase in volume due to foaming. Increase in volume should not be more than 5.00%

8. **Packing:** The material should be packed in 50 litre capacity leak proof HDPE carbuoys with leak tight stopper and screw caps.

9. Markings: each drum should have clear legible markings as given below:

(i) Name of the product
(ii) Name of the supplier
(iii) Date/month/year of manufacture

12.12 **POLYANIONIC CELLULOSE – SUPERLO GRADE (PAC-SL)**

Specification:

1. **Physical Properties:** The material, as received, should be a free flowing white to creamish/brownish white powder free from foreign matter and visible impurities.

2. Moisture content, measured by drying at 105+/- 2 degC, % by mass, maximum. : 15.00

3. Apparent viscosity of 1.0% (w/v) suspension of the material, as received, in fresh water and 4% salt water:
Prepare a 1% (w/v) suspension of the sample by stirring in a multimixer for 30 minutes in distilled water and 4% salt water(prepared by dissolving 4 gms of LR grade NaCl in 100 ml distilled water) and measure the apparent viscosity at 26+/- 2 degC by a Fann VG meter.

(i) Apparent viscosity in fresh water, cp, max.: 20
(ii) Apparent viscosity in salt water, cp, max.: 16

4. **Yield of 15 cp apparent viscosity suspension:**
Prepare a 15 cp apparent viscosity suspension of the sample by stirring in a multimixer for 30 minutes in distilled water and 4% saltwater (prepared by

dissolving 4 gms of LR grade NaCl in 100 ml distilled water) and calculate the yield of the sample which should be as follows :

(i) Yield in distilled water, KL/MT, minimum: 100
(ii) Yield in 4% salt water, KL/MT, minimum : 80

5. Sodium carboxymethyl cellulose content, on dry basis, % by mass, (on dry basis), minimum. : 85.00

6. Degree of substitution, minimum: 1.00

7. **Performance test:**

A. **In fresh water mud-**
(i) **Preparation of base mud:**
Prepare a 10.0% (w/v) suspension of OIL / API approved Bentonite in distilled water and stir the suspension for 15 minutes in multimixer so that no lumps are left after the stirring period. Age the suspension for 72 hrs at 90+/-2 degC. After the lapse of the aging period, cool and adjust apparent viscosity in the range of 15-20 cp with distilled water. Also adjust PH in the range of 9.0-9.5 with 10%NaOHsolution,if necessary. Stir the suspension for 15 minutes in multimixer and determine apparent viscosity, yield value and API fluid loss of the suspension at 26+/-2 degC which should be as follows:

(a) Apparent viscosity, cp : 15-20
(b) Yield value, lbs/100 ft sq : To determine
I API fluid loss, ml : To determine

(ii) **Preparation of treated mud.**
Treat the base mud 7A(i) with 0.5% (w/v) polyanionic cellulose(superlo grade) sample. Stir in a multimixer for 30 minutes and divide the mud into two parts.

Performance at 26+/- 2 degC

Measure apparent viscosity, yield value and API fluid loss of one part of the treated mud 7A (ii) at 26+/-2 degC which should be as follows.

(a) Apparent viscosity, cp, max. : 2.5 times of 7A, ia
(b) Yield value, lbs/100ftsq,max. : 1.5 times of 7A,ib
I API fluid loss, ml, max. : 50% of 7A,ic

Performance at 120+/-2 degC

Age second part of the treated mud 7A(ii) at 120 +/-2 degC in rolling condition for 24 hrs. After aging, cool to 26+/-2 degC and stir in a multimixer for 15 minutes and determine apparent viscosity, yield value and API fluid loss of the mud at 26+/-2 degC which should be as follows:

(a) Apparent viscosity, cp,max. : 1.5 times of 7A, ia
(b) Yield value, lbs/100ftsq.max : 1.5 times of 7A,ib
I API fluid loss, ml, max. : 35% of 7A, ic

B. **In salt water mud**
(i) Preparation of base mud:

Prepare a 105% (w/v) suspension of OIL / API approved Bentonite in distilled water and stir the suspension for 15 minutes in multimixer so that no lumps are left after the stirring period. Age the suspension for 72 hrs at 90+/-2 degC. After the lapse of the aging period, cool and add 4% NaCl (w/v) LR grade) and age for 24 hrs.at 26+/-2 degC. Dilute the suspension with 4% NaCl solution and adjust apparent viscosity in the range 15-20 cp. Adjust PH in the range 9.0 – 9.5 with 10% NaOH solution, if necessary. Determine apparent viscosity, yield value and API fluid loss of the suspension at 26+/-2 degC which should be as follows.

(a) Apparent viscosity, cp: 15 – 20
(b) Yield value, lbs/100 ftsq : To determine
I API fluid loss, ml: To determine

Treat the base mud prepared as per 7B(i) with 0.5% (w/v) of polyanionic cellulose (superlo grade) sample and stir for 30minutes in a multimixer.
Performance at 26+/-2 degC

Determine apparent viscosity, yield value and API fluid loss of the treated mud 7B(ii) at 26+/-2 degC which should be as follows:

(a) Apparent viscosity, cp, min.: 2 times of 7B,ia
(b) Yield value, lbs/100ftsq, min: 1.5 times of 7B,ib
I API fluid loss, ml, max. : 15% of 7B, ic

8. **Packing:**
The material should be packed in multi walled paper bags with at least two innermost layers suitably water proofed, strong enough to with stand rigorous of transit and storage. Capacity 25 kgs net per bag.

9. Each bag should have clear legible marking as given below:
(i) Name of the product
(ii) Name of the supplier
(iii) Date/month/year of manufacture

N.B.:
1) Apparent viscosity to be measure by a Fan VG meter and API fluid loss to be measured in standard API fluid loss apparatus using compressed air or nitrogen as pressure source.

2) The Supplied Materials must meet OIL's specifications in allrespect.

12.13 **Resinated Lignite:**

Specification:
1. Physical State: The material, as received, should be black or brown coloured free flowing powder, free from lumps, dirt and foreign matter.

2. Moisture Content, measured at 105 +/- 2 deg C., % by mass, Maximum: 15.00

3. Solubility in Distilled water at 26 +/- 2 degC, % by mass, minimum: 70.00

4. Apparent Viscosity of 2 % solution in distilled water at 26 +/- 2degC, cp, and maximum. : 3.00

5. **Caking Tendency:** Should not display any caking tendency when heated to 50 degC

6. **Chemical Assay % by mass:**
   (i) Element Iron maximum: 1.80
   (ii) Elemental Chromium maximum: 0.10

7. **Performance Test:**

A. ***In Fresh Water Mud:***

(i) **Preparation of base mud**
Prepare a 10% (w/v) Bentonite suspension in distilled water using OIL / API approved Bentonite and stir the suspension in a multimixer for15 minutes so that no lumps are left after the stirring period. Age the suspension for 72 hrs. at 90 +/- 2 degC. After the lapses of the aging period cool the suspension and adjust the apparent viscosity to 52.5 +/- 2.5 cp by dilution with distilled water, if necessary divide the mud into two parts.

(ii) **Untreated mud.**
Age first part of base mud at 160 +/-2DegC in rolling condition for 24 hrs. Cool the mud and stir in a multimixer for15 minutes. Determine apparent viscosity at 26 +/- 2 degC and HPHT fluid loss at 160 degC and 500 PSI differential pressure.
   (a) Apparent viscosity, cp: To determine
   (b) HPHT fluid loss, ml : To determine

(iii) **Treated mud.**
Treat second part of base mud with 2.0 % (w/v) of the 27esonated lignite sample and stir the mud for 30 minutes in a multimixer. Adjust the PH of the mud to 9.5 – 10.0 by addition with 5N NaOH solution, if necessary. Age the treated mud at 160 +/- 2 degC for 24 hrs. in rolling condition. Cool and stir for 15 minutes in multimixer. Determine apparent viscosity at 26 +/- 2 deg C and HPHT fluid loss at 160 degC and 500 PSI differential pressure which should be as follows.
   (i) Apparent viscosity, cp, maximum: 40 % of 7A (ii,a)
   (ii) HPHT fluid loss, ml maximum : 50 % of 7A (ii,b)

B. In Saline Water Mud:

(i) Preparation of base mud.
Prepare a 10% (w/v) Bentonite suspension in distilled water using OIL / API approved Bentonite and stir the suspension in a multimixer for15 minutes so that no lumps are left after the stirring period. Age the suspension for 72 hrs. at 90 +/- 2 degC. After the lapse of the aging period cool and stir the suspension for 15 minutes in multimixer and determine apparent viscosity which should be 85+/- 5 cp To this mud add 4% Nacl (w/v) (LR grade) and stir for 30minutes in a multimixer. Age the mud 24 hrs. at 26 +/- 2 degC. After aging, stir the mud again for 15 minutes and determine apparent viscosity at 26 +/- 2 degC which should be 32.5 +/- 2.5cp. Divide the mud into two parts by dilution with distilled water, if necessary.

(ii) **Untreated mud.**
Age the first part of saline mud for 24 hrs. at 160 +/-2 degC in rolling condition cool the mud stir for 15 minutes and measure apparent viscosity 26 +/- 2 deg C and HPHT fluid loss at 160 degC and 500 PSI differential pressure for 24 hrs. Cool the mud and stir in a multimixer for15 minutes. Determine apparent viscosity at 26 +/- 2 deg C and HPHT fluid loss at 160 degC and500 PSI differential pressure.
   (a) Apparent viscosity, cp : To determine
   (b) HPHT fluid loss, ml : To determine

(iii) **Treated mud.**
Treat the second part of the saline mud with 2% 28esonated lignite sample and stir the mud for 30 minutes in multimixer. Age the treated mud for 24 hrs at 160 +/- 2 degC in rolling condition. Coolthe mud and stir in multimixer for 15 minutes. Determine apparent viscosity at 26 +/- 2 DegC and HPHT fluid loss at 160 degC and 500 PSI differential pressure which should be as under.

(i) Apparent viscosity, cp, max. : should not be more than that of 7B (ii,a)
(ii) (ii) HPHT fluid loss, ml max. : 50 % of mud of 7B (ii,b)

8. **Packing** : The material should be packed in good quality moisture proof multiply paper bag strong enough to withstand rigorous of transit and storage .Capacity 25 kg net per bag.

9. **Marking:** Each bag should have clear legible marking as given below.
(i) Name of the product.
(ii) Name of the supplier/manufacturer
(iii) Date/Month/Year of Manufacturer

N.B.: The apparent viscosity shall be measured by a Fann Vgmeter and the HPHT fluid loss shall be measured in standard HPHT fluid loss apparatus using nitrogen gas as the pressure source.

12.14 **LINSEED OIL:**

Specification:

1. **Physical Properties:** The material, as received, should be golden yellow, brownish yellow coloured clear viscous liquid free from suspended solids/impurities and other adulterants.
2. Density at 26 +/- 2 degC : 0.9230 – 0.9280
3. Acid value, mgKOH/gm, maximum: 10.00
4. Moisture content, % by mass, max. : 0.25
5. Refractive Index at 40 degC: 1.4720 – 1.4750
6. Performance Test:

A. **Lubricity test –**
(i) In fresh water mud : Prepare a 7.5% (w/v) Bentonite suspension in distilled water using OIL / API approved Bentonite and stir it for 15minutes in multimixer so that no lumps are left after the stirring period. Age the suspension for 72 hrs at 90 +/- 2 degC. After the lapse of aging period, adjust apparent viscosity of the suspension to 15 +/- 1 cp by dilution with distilled water. To this, add 0.5%(w/v) of the sample while stirring, after completion of addition, stir further for 30 minutes in a multimixer. Measure lubricity co-efficient by using a lubricity tester.
Lubricity co-efficient should not be more than 0.15

(ii) In saline water mud – Prepare a 10% (w/v) Bentonite suspension in distilled water using OIL / API approved Bentonite and stir for 15 min, in multimixer so that no lumps are left after the stirring period. Age the suspension for 72 hrs at 90 +/- 2 degC. After lapse of aging period, add 4% NaCl (w/v) (AR grade) and stir for 15minutes in a multimixer. Age the suspension for 24 hrs at 26 +/- 2degC. Adjust the apparent viscosity to 15 +/- 1 cp by dilution with4% NaCl solution, if necessary. To this saline mud, add 0.50%(w/v) of the sample in stirring condition and stir further for 30minutes in a multimixer. Measure lubricity co-efficient by using a lubricity tester.

Lubricity co-efficient should not be more than 0.20

B. Extreme Pressure Lubrication test –

(i) **In fresh water mud** – Prepare a 7.5% (w/v) Bentonite suspension in distilled water using OIL / API approved Bentonite and stir for 15 minutes in multimixer so that no lumps are left after the stirring period. Age the suspension for 72 hrs. at 90 +/- 2 degC.After the lapse of aging period, adjust apparent viscosity of the suspension to 15 +/- 1 cp by dilution with distilled water and filter through 200 BSS mesh or equivalent sieve. Add 0.5% (w/v) of the sample to the Bentonite suspension while stirring. After completionof addition, stir again in the multimixer for 30 min. Determine the film strength of the mud at 250 in-lb load with the help of an E.P. lubricity tester.

The film strength should be 20,000 psi minimum.

(ii) **In saline water mud** – Prepare a 10% (w/v) Bentonite suspension in distilled water using OIL / API approved Bentonite and stirfor 15 min. in multimixer so that no lumps are left after the stirring period. Age the suspension for 72 hrs at 90 +/- 2 degC. After lapse of aging period, add 4% Nacl (w/v) (AR grade) and stir for 15minutes in a multimixer. Age the suspension for 24 hrs. at 26 +/- 2degC. Adjust the apparent viscosity to 15 +/- 1 cp by dilution with4% NaCl solution, if necessary and filter through 200 BSS meshor equivalent sieve. Add 0.5% (w/v) of the sample while stirring and stir further for 30 minutes in multimixer. Determine the film strength of the mud at 250 in-lb load with the help of a E.P. lubricity tester.

The film strength should be 15,000 psi, minimum

C. **Foam Test:** Prepare a 7.5% (w/v) Bentonite suspension in distilled water using OIL / API approved Bentonite and stir for 15 min in multimixer. Age the suspension for 24 hrs. at 26 +/- 2 degC. Adjust the apparent viscosity of the suspension to 15 +/- 1 cp bydilution with distilled water. Add 0.5% (w/v) of the sample to it and stir for 30 minutes in a multimixer. Determine the specific gravity of the mud.
The specific gravity of the mud should not be less than 0.8.

7. **Field Performance Criteria:** The following performance needs to be fulfilled.

a) Linseed oil must be stable at Lower temperature (<15 degC) and there should not be any deposition at the bottom of the container at low temperature.
b) Linseed oil should be easily miscible with water and water based mud system.
c) It should be compatible with mud additives used in water based mud system.
d) Foaming should not occur during field application of the product.

8. **Packing:** The material should be packed in 50 litre capacity leak proof HDPE carbuoys with leak tight stopper and screw caps.

9. **Markings**: Each carbuoys should have clear legible markings as given below:
(i) Name of the product
(ii) Name of the supplier
(iii) Date/month/year of manufacture

N.B.: Apparent viscosity to be measured by a Fann VG meter and lubricity should be measured by a E.P. lubricity tester.

12.15 **Sodium Formate:**

Specifications

An environmental friendly, non-corrosive organic brine to use as weighing agent in drilling fluids, workover fluids, completion fluids/packer fluids in oilfield operations. The material should have the following specifications:

1. **Physical State:** The material should be in the form of white granules or crystalline free flowing white powder free from lumps and other impurities. The material should be easily soluble in water.

2. Purity as Sodium Formate, percent by mass, minimum: 95%, minimum

3. Moisture Content, % by mass: 1.00 maximum

4. Organic impurities, percent by mass, Maximum: 4.00

5. Volatile matter, percent by mass, maximum: 4.00

6. Matter insoluble in water, percent by mass, maximum: Nil

7. Sulphate content: Nil

8. Chloride Content: Nil

9. Iron content, ppm, max. : 10

10. **Packing:** The material should be packed in moisture proofedHDPE bag with insert of polythene bag or in multiply paper bags (6 ply) and should be strong enough to withstand rigorous of transit and storage.Net weight: 25/ 50 Kgs per bag.

12.16 **Glycol**

Specifications:

1. **Physical State**: The material shall be in the form of liquid at 24 ± 2 degC, free from visible impurities.

2. pH of 3% (v/v) Sample in 5% (w/v) KCl Solution in Distilled water : 6.0 – 7.5

3. Surface Tension of 3% (v/v) Sample in 5% (w/v) KCl Solution in Distilled Water, dynes / cm3.: 40 ± 5

4. Hydroxyl Value, mg KOH / g of Sample: 150 – 200

5. Iodoform Test for Confirmation of Presence of carbon in Sample: Should be Positive.

6. **Performance Test:**

(i) **Preparation of Base Mud:** Prepare 10 – 15 cp Bentonite Suspension from pre-hydrated Bentonite Suspension [prepared by stirring 10% (w/v) Bentonite in Distilled Water for 30 minutes using a laboratory stirrer (5000 # 6000 rpm) and aged for 72 hours at 90 ± 2 °C] by diluting with Distilled Water and stirring in a Hamilton Beach Mixer for 20 minutes. Treat the prepared Bentonite Suspension with KCl (5% w/v) and age for 24 hours at 24 ± 2 °C. After that add PHPA (0.2% w/v) + PAC (Regular Grade) (0.5% w/v) + PAC (Low Viscosity Grade) (0.3% w/v) +

KOH (pH 9.0 – 9.5), while stirring in a Hamilton Beach Mixer at high speed for 20 minutes.

(ii) Hot roll the Base Mud at 100 °C for 18 hours in a roller oven. After aging cool the Mud to 24 ± 2 °C and stir in a Hamilton Beach Mixer for 20 minutes at high speed. Determine the Apparent Viscosity (cP) and the Yield Point (lbs/100 sq. ft) by Fann VG Meter or Equivalent. Also measure the Lubricity Coefficient, using a Lubricity Tester and HP-HT Filtration Loss (ml / 30 minutes) at 500 psi and 100 °C, using a HP-HT Filtration Apparatus. Record Apparent Viscosity, Yield Point, Lubricity Coefficient and HP-HT Filtration Loss of the hot rolled base mud.
a)Apparent Viscosity, cp = To determine
b) Yield Value, lbs/100 ft sq = To determine
c) HPHT Fluid liss, ml = To determine
d) Lubricity Coeficient = To determine

(iii) Treat the Base Mud with 3% (v/v) Sample in a Hamilton Beach Mixer stirring for 20 minutes. Hot roll the treated Base Mud at 100 °C for 18 hours in a roller oven. After aging cool the Mud to 24 ± 2 °C and stir in a Hamilton Beach Mixer for 20 minutes at high speed / medium speed. Determine Apparent Viscosity (cP), Yield Point (lbs/100 sq. ft), Lubricity Coefficient and HPHT Filtration Loss (ml / 30 minutes) at 500 psi and 100 °C, as in 6 (ii) above.

a) Apparent Viscosity of the treated hot rolled base mud should not be less than the value obtained for hot rolled base mud 6 (ii).

b) Yield Point of the treated hot rolled base mud should not be less than the value obtained for hot rolled base mud 6 (ii).

c) Lubricity Coefficient of the treated hot rolled base mud should not be more than 80% of the value obtained for hot rolled mud 6 (ii).

d) HP-HT Filtration Loss of the treated hot rolled base mud should not be more than 70% of the value obtained for hot rolled mud 6 (ii).

7. Cloud Point of 3% (v/v) Sample in 5% (w/v) KCl in Distilled Water: 60-72 deg C

12.17 **Micronized Calcium Carbonate (MCC):**

Specifications

1. **Physical properties:** State-Fine Powder free from dirt & foreign matter;
2. Water soluble content (by weight), max; 0.35%
3. Specific gravity (minimum) at 24+/-2degC: 2.6
4. Purity as Calcium Carbonate by weight (minimum): 96%
5. Solubility in 15% wt/wt HCl, by weight (minimum): 96%
6. Particle size distribution % by volume as measured by light scattering technology- D10- < 4 micron; D50- 4-15 micron; D90- 15-60micron.
7. Particle retain on 200 mesh ASTM- 2% by weight max.

12.18 **Pre-gelatinized Starch:**

Specifications:

1. **Physical State**: The material shall be in the form of powder, free from lumps and visible impurities

2. Moisture Content at 105 ± 2 °C, percent by mass: 10.0(Maximum)

3. pH of 2% (w/v) Solution of the Material in Distilled Water at 24 ±2 °C: 10.0 (Minimum)

4. Apparent Viscosity of 2% (w/v) Solution in Distilled Water at 24± 2 °C,: 10.0cP (Max)

5. Qualitative Test for Presence of Starch: Positive

6. **Bacterial Degradation test:** Should not Biodegrade for at least 3days.

7. **Performance Test:**

(a) ***In Fresh Water Mud:***
(i) Prepare Base Mud using OIL / API approved Bentonite having Apparent Viscosity 25 cP (Maximum) and API Filtration Loss 20 ± 2 ml at 24 ± 2 °C, from pre-hydrated Bentonite suspension (prepared by stirring 10% (w/v) Bentonite in Distilled Water for 30minutes using laboratory stirrer (5000 – 6000 rpm) and aged for 72hours at 90 ± 2 °C) by diluting with distilled Water and stirring in Hamilton Beach Mixer for 30 minutes at high speed. Measure Apparent Viscosity (cP) at 24 ± 2 °C by a Fann VG Meter or Equivalent and Filtration Loss (ml) by API Filtration Tester. RecordApparent Viscosity and API Filtration Loss of the fresh water base mud.

(a) Apparent viscosity, cp, max = 25
(b) API Fluid loss, ml = 18.0 – 22.0

(ii) Treat the Base Mud 7 (a) (i) with 1.0% Pre-gelatinized Starch (1.0 g of Sample for each 100 ml of Base Mud) while stirring in Hamilton Beach Mixer at high speed. Stir for 30 minutes and measure Apparent Viscosity and API Filtration Loss of Treated mud at 24 ± 2 ° C.
Apparent Viscosity of the treated fresh water base mud should not be more than 55.0 cp. API Filtration Loss of the treated fresh water base mud should not be more than 50% of the value obtained for fresh water base mud.

(b) ***In salt water mud:***
(i) Prepare 10.0% (w/v) Bentonite Suspension in Distilled Water from OIL / API approved Bentonite by stirring for 30 minutes in laboratory stirrer (5000 – 6000 rpm) and age it for 72 hours at 90 ±2 °C. Treat the Mud with 4.0% (w/v) NaCl (AR/GR grade) and0.35% (w/v) Sodium Bicarbonate (AR/GR grade). Stir for 15minutes at high speed in Hamilton Beach Mixer and age it for 24hours at 24 ± 2 °C. Further dilute the suspension as required with a solution of 4.0% NaCl (AR / GR Grade) in distilled water with stirring in Hamilton Beach Mixer at high speed for 30 minutes to achieve API Filtration Loss of 80 ± 5 ml at 24 ± 2 °C. Measure Apparent Viscosity (cP) and API Filtration Loss (ml) ofthe Salt Water Base Mud at 24 ± 2 ° C. Record Apparent Viscosity and API Filtration Loss of the salt water base mud.

(a) Apparent viscosity, cp, max = To determine
(b) API Fluid loss, ml = 75 -85

(ii) Treat the Base Mud 7 (b) (i) with 1.0% Pre-gelatinized Starch (1.0 g Sample, for each 100 ml of Base Mud) stir in Hamilton Beach Mixer at high speed for 30 minutes. Then determine Apparent Viscosity and API Filtration Loss at 24 ± 2 °C. Apparent Viscosity of the treated salt water base mud should not be less than the value obtained for the salt water base mud 7 (b)(i).API Filtration Loss of the treated

salt water base mud should notbe more than 20% of the value obtained for the salt water base mud 7 (b) (i).
Note:

Packing: Moisture proof Multi-layered Paper bag with polythene inner lining (100 gauge) strong enough to withstand rigorous of transit and storage, capacity 25 kg net per bag.

Marking: Each bag shall have clearly legible marking as given below:
a) Name of Product
b) Name of Supplier
c) Date/Month/Year of manufacture

Note:
Packing: Moisture proof Multi-layered Paper bag with polythene inner lining (100 gauge) strong enough to withstand rigors of transit and storage, capacity 25 kg net per bag.

12.19 **SULPHONATED ASHPHALT:**

Specification:

1. **Physical properties:** The material, as received, should be a free flowing brown to black coloured powder, free from lump and other foreign matter.

2. Moisture content, measured by drying at 105 +/- 2 degC, % by mass, maximum: 10.00

3. Soluble matter content, % by mass
(i) In distilled water : 65 – 70
(ii) In dimethyl sulphoxide: 30 – 35

4. pH of 2% (w/v) solution in distilled water at 26 +/- 2 degC, minimum: 8.5

5. Qualitative test for presence of sulphonate group: Positive

6. Barium chloride test: Mix 1% (w/v) of the sample in distilled water and stirin multimixer for 10 minutes. To this add 150 ml distilled water and 0.5 gm barium chloride (LR grade) and again stir for 10 minutes in multimixer. Pour the content to a beaker and observe after 30 minutes. No formation and setting of black coloured precipitates should take place.

7. **Performance Test:**
A. **Lubricity test:** Prepare a 7.5% (w/v) Bentonite suspension in distilled water using OIL approved Bentonite and stir the suspension for 15 minutes in multimixer so that no lumps are left after the stirring period. Age the suspension for 72 hrs at 90 +/- 2 degC. After the lapse of the aging period, cool the suspension and stir for 15 minutes in multimixer. Adjust apparent viscosity for the suspension to 15 cp by dilution with distilled water, if distilled water, if necessary. Treat the suspension with 2.0% (w/v) sulphonated asphalt sample and stir for 30 minutes in multimixer for lubricity test. Determine lubricity co-efficient using a standard mud lubricity tester.
Lubricity co-efficient should not be more than 0.30

B. **Inhibition Test:**
In Bentonite suspension:

(a) **Preparation of base mud**: Prepare a Bentonite suspension by stirring 7.5% (w/v) OIL / API approved Bentonite in distilled water in a multimixer for 15 minutes. Determine apparent viscosity and value of this base mud immediately at 26 +/- 2 degC.

(i) Apparent viscosity, cp : To record
(ii) Yield value, lbs/100 ftsq : To record

(b) **Preparation of treated mud:** Add 3% (w/v) sulphonated asphalt sample to distilled water and stir in multimixer for 15 mintes. To this add 7.5%(w/v) OIL / API approved Bentonite and stir for additional 15 minutes in a multimixer. Determine apparent viscosity and yield value of this treated mud at 26 +/- 2 degC which should be as follows:

(i) Apparent viscosity ,cp,max. : 35% of 7B(I)(a,i)
(ii) Yield value,lbs/100 ftsq, max: 15% of 7B(I)(a,ii)

In Bentonite and kaolin mixture:

(a) **Preparation of base mud:** Prepare a base mud using 52.5 gms of OIL / API approved Bentonite and 263 gms of kaolin powder in 1000ml distilled water. Adjust PH to 10.5 by 5 N NaOH solutions. Mix thoroughly in a multimixer for 30 minutes and divide the suspension into two parts. Hot age one part at 65 degC in rolling condition for 18 hrs. After the lapse of the aging period, cool and stir for further 10 minutes in multimixer. Measure apparent viscosity and yield value of the mud at 26 +/- 2 degC.

(i) Apparent viscosity, cp : To record
(ii) Yield value, lbs/100 ftsq : To record

(b) **Preparation of treated mud:**

To the other part of the mud, add 3% (w/v) of the sulphonated asphalt sample and mix in multimixerfor 30 minutes. Hot age the mud at 65 degC in rolling condition for 18 hrs. After the lapse of the aging period, cool and stir the mud for 10 minutes in multimixer. Measure apparent viscosity and yield value at 26 +/- 2 degC which should be as follows:

(i) Apparent viscosity, cp,min.: 40% of 7B (II)(a,i)
(ii) Yield value,lbs/100 ftsq, min.:25%of 7B(II)(a,ii)

8. **Packing:**
The material should be packed in multi walled paper bags with at least six layers and two innermost layers suitably water proofed, strong enough to withstand rigorous of transit and storage. Capacity 25 kgs net per bag.

9. **Markings:**
Each bag should have clear legible markings as given below:

(i) Name of the product
(ii) Name of the supplier
(iii) Date/month/year of manufacture

N.B. Apparent viscosity will be measured by a Fann VG meter and API fluid loss will be measured, in standard API fluid loss apparatus using compressed air or nitrogen as pressure source.

12.20 **POTASSIUM SULPHATE**

Specifications:

General purpose of use: To use in environmental friendly polymer mud system as clay inhibiting agent (Potassium Ion source) in place of Potassium Chloride

1. Physical Properties: The material shall be in the form of crystalline solid or powder, free from visible impurities.
2. Moisture Content at 105 +/-2 Deg C, % by mass: 2.00 (Maximum)
3. Matter Insoluble in Water on Dry Basis, percent by mass: 0.5 (Maximum)
4. Calcium as Ca++ on Dry Basis, ppm: 2000 (Maximum)
5. Purity as Potassium Sulphate on Dry Basis, percent by mass: 96.0 (Minimum)
6. Packing: The material should be packed in polythene bag (100 gauge) which in turn should be packed in HDPE bag strong enough to withstand rigours of transit and storage. The material should be supplied in the original packing of the manufacturer. Capacity 50 kg net per bag.
7. Marking: Each bag shall have clear legible markings as given below:

` I. Name of the product
II. Name of the supplier
III. Date/Month/Year of manufacture
IV. Supply order number against which the present supply is made

12.21 **POTASSIUM HYDROXIDE**

Specification:

1. Physical Properties: The material, as received, should be in the form of pallets or flakes free from dirt or foreign matter. Should be determined visually.
2. Total Alkalinity as KOH, % by mass: Minimum: 87.0
3. Sodium as Na, % by mass: Maximum: 1.00

KEY PERFORMANCE INDICATORS:

Bidder shall provide mud Engineering Services under this contract with respect to the following key performance Indicators:

a. NPT (Mud Loss)
b. NPT (Stuck-Pipe)
c. NPT (Logging)
d. Incidence/frequency of hole packing off.
e. Drilling Fluid Cost/meter
f. NPT (Supply of Chemicals)
g. Quality of additives
h. Hole cleaning efficiency
i. Caliper
j. Productivity of Well

&&&

B. SCHEDULE OF RATES (MUD ENGINEERING SERVICES)

The bidder shall quote the rates/prices in their Price Bid strictly as per PROFORMA-B (Appendix-3 and Appendix-4). The quantity/parameter/No. of days etc. shown against each item in the Tables is tentative and valid for Bid Evaluation purpose only. Payment to the successful Bidder/Contractor shall be made on the basis of actual utilization/ work done/quantity consumed. All "DAY RATE" charges shall be quoted for 24 hours a day basis. But, for part of a day, the same shall be payable on pro-rata up to the nearest half an hour basis. Commercial evaluation of Bids to establish inter-se-ranking of all technically qualified bidders will be done based on the rates/charges quoted in these Tables only.

1.0 MOBILIZATION CHARGES: (LUMP SUM)

[For Personnel, Mud Lab. Complete with all Equipment, Tools, Accessories & Consumables etc.]

a) Mobilization charges shall be payable one time lump sum which shall cover all local and foreign costs (if any) to be incurred by the Contractor to mobilize the Personnel, Mud Laboratory complete with all necessary equipment, tools, accessories and consumables as specified in the Contract, to the first drilling location in Tripura, India and shall include all local taxes & levies (including State Entry Tax, any other tax under Schedule-VI area in Assam, if any, port fees, transportation/freight & insurance etc., but excluding Customs Duty.

b) Company will issue Recommendatory Letters on the basis of requisite documents to be provided by the Contractor for import of items at least 15 days in advance, if envisaged in PROFORMA-A2, for Contractor to obtain necessary Essentiality Certificates (EC) from the Directorate General of Hydrocarbon (DGH), India to avail concessional Customs Duty. However, securing EC and payment of port rent, demurrage etc. and clearance of goods through Indian Customs will be exclusive responsibility of the Contractor.

c) Mobilization charges shall be payable only when all requisite materials, equipment and crew are mobilized at site and positioned to undertake/commence the assigned work under the Contract at the first drilling location in Tripura and duly certified by Company's Engineer/ Representative.
Total Mobilization Charges quoted for Mud engineering services should not exceed 7.5% of the total contract value for the Mud engineering service part.

2.0 DEMOBILIZATION CHARGES: (LUMP SUM)

[For Personnel, Mud Lab with all Equipment, Tools, Accessories & Consumables and Chemicals etc.]

a) The Demobilization Charges shall be payable one time on lump sum basis which shall cover all expenses of Contractor towards demobilization of Personnel, complete Mud Laboratory including all equipment, tools, accessories and leftover chemicals/ additives/consumables from the last drilling location to Contractor's base or elsewhere at the option of Contractor upon completion/termination of the Contract.

b) All charges connected with demobilization including all fees, duties and taxes in relation thereto, insurance and freight within India or on export/re-export outside India will be to Contractor's account.

c) All contractual Day Rates/Charges shall cease to exist with effect from the date and time or event as to be specified by Company in the demobilization notice. No charges whatsoever will be payable thereafter.
d) Demobilization charges shall be paid to the Contractor after successful completion of all their contractual obligations as per provisions of the contract including re-export formalities.
e) The Contractor will ensure that demobilization is completed and Company's work-site is cleared-off Contractor's property within 30 (thirty) days of notice from the Company.
f) Total Demobilization Charges quoted should not be less than 2% the total contract value for the Mud engineering service part.

3.0 CHARGES FOR MUD LAB AND ALL EQUIPMENTS: [For Mud Lab. Complete with all Equipment, Tools, and Accessories & Consumables etc.]

3.0.1. OPERATIONAL CHARGES (OPERATIONAL DAY RATE):

a) The Operational Charges (Operational Day Rate) for the Mud Laboratory including all testing equipment etc. shall be quoted on per day of 24 hours basis and the same shall be payable for the period of normal drilling operations at site with effect from the date of spudding in of the well. For part of a day, payment will be calculated on Pro-rata basis to the nearest half an hour only.
b) Operational Day Rate shall include the rental of Mud Laboratory & all other equipment/tools. Cost of operation & maintenance of all such equipment including supply of spares and consumables as may be required from time to time during the Contract period shall also be included. The Contractor must maintain adequate stock of such regularly required items/ spares at the drilling site under their possession to ensure uninterrupted service.
c) Equipment Hiring Charges shall not be payable, if the Contractor withdraws the whole or part of the equipment or any manpower affecting operations.
d) If Contractor's tool/equipment fails to perform, for any reason during the operation, no Hiring Charges shall become payable until the equipment/ tool is put back into operating condition or evidenced by demonstration of operation in actual tests or use to the satisfaction of OIL.

3.0.2. STANDBY/RENTAL CHARGES (STANDBY/RENTAL DAY RATE)

a) Standby/Rental charges for Contractor's Mud Lab. & other Testing Equipment shall be payable for the period beyond initial 48 hours when normal drilling operations are suspended due to rig repair/ or, any operational shutdown takes place for any reason not related to the services provided under this bundle service contract, leading to suspension of Mud Engineering Services continuously for more than 48 hours.
However, for the initial consecutive 48 hours of suspension of Mud Engineering Services under such conditions, the Operational Day Rate as per Clause "3.0.1" above shall be payable. The Standby/Rental Day Rate shall apply only for the period beyond initial 48 hours till resumption of normal services.

b) Equipment Standby/Rental Day Rate shall be quoted on per Day of 24 hours basis and for the purpose of payment the same shall be pro-rated to the nearest half an hour for part of a day, if any.

4.0 CHARGES FOR PERSONNEL:

4.0.1. OPERATIONAL CHARGES FOR MUD ENGINEERS (PER ENGINEER PER DAY):

a) Operational charges shall be payable for the Mud Engineers to be deployed by the Contractor on per Engineer per Day of 24 hours basis for two (2) Engineers on twelve (12) hourly shifts at site. The same is also payable on pro-rata to the nearest half an hour basis for part of a day, if any.

b) The Contractor may engage additional personnel for maintenance or assistance in the performance of the Work. However, Company will neither be responsible nor pay any charge or day rate for such additional personnel, if deployed any.

c) Operational charges shall be payable for the Mud Engineers to perform their Work as envisaged under the Contract from the day the Contractor completes Mobilization of Contractor's personnel at the designated Locations in conformity with the contractual provisions/mobilization notice.

d) The Contractor shall provide statutory "OFF" to their well site Mud Engineers and other personnel as per Mines Act. & other statutory regulations and arrange for crew change from time to time at their cost. All such expenditure including enroute expenses of Contractor's personnel shall be borne by the Contractor. No extra payment whatsoever will be due from Company on this account.

4.0.2. STANDBY/RENTAL CHARGES FOR MUD ENGINEERS (PER ENGINEER PER DAY)

a) Standby/Rental charges for Contractor's Mud Engineers shall be payable for the period beyond initial 48 hours when normal drilling operations are suspended due to rig repair/ or, any operational shutdown takes place for any reason not attributable to the services provided under this bundle service contract, leading to suspension of Mud Engineering Services continuously for more than 48 hours. However, for the initial 48 hours of suspension of Mud Engineering Services under such conditions, the Operational Day Rate as per Clause "4.0.1" above shall be payable. The Standby/Rental Day Rate shall apply only for the period beyond initial 48 hours till resumption of normal services.

b) Standby/Rental charges shall be payable for the Mud Engineers to be deployed by the Contractor on per Engineer per Day of 24 hours basis for two (2) Engineers on twelve (12) hourly shifts at site. The same is also payable on pro-rata basis to the nearest half an hour only for part of a day, if any.

5.0. INTER –LOCATION MOVEMENT (ILM) CHARGES:

(For Mud Lab., Tools, Equipment, Accessories, and Consumables & Personnel)

a) The Contractor shall be solely responsible to carry out inter-location movement of their materials viz; Mud Laboratory complete with all equipment, tools, accessories, consumables, leftover chemicals & additives and manpower etc. from one location after completion of drilling/testing program to the next location

as to be decided by Company to take up the Mud Engineering Services at the forward location under the contract. Inter-location move rate will be payable depending on the distance between the two locations. Therefore, the inter-location movement rate has been provisioned in two parts in this contract i.e.

(i) All-inclusive lump sum fixed charge for inter-location movement up to a maximum distance of thirty (30) KM.

(ii) All-inclusive Rate per KM for the distance beyond initial thirty (30) KM.

Wherever, the distance between two locations for inter-location movement exceeds 30 KM, both above rates will be considered to calculate the total inter-location movement charge and payment will be made accordingly.

b) The Contractor shall carry out inter-location movement of their materials on completion of operation at one well upon receipt of ILM notice from the Company. ILM Charges shall be payable after the materials and personnel of the Contractor are shifted entirely to the designated forward location and all equipment, tools etc. are placed/installed/tested/calibrated to its rated specifications to the satisfaction of OIL as per operational requirements.

c) During inter-location movement, shifting of Mud Laboratory complete with all equipment, tools, accessories, consumables, leftover chemicals & additives and manpower etc. deployed by the Contractor shall be the sole responsibility of the Contractor. However, the services of Crane as may be required for loading and unloading of Mud Lab. At the respective well site/location will be arranged by Company free of cost through a third party Service Provider (i.e., Drilling Rig Service Provider). But, necessary supervision to ensure safe loading and unloading will be the sole responsibility of Mud Engineering Contractor.

d) The Contractor shall be allowed to complete the ILM of their belongings within twenty (20) days from the date of ILM notice issued by the Company upto an inter-location distance of thirty (30) KM. In case the distance between two locations exceeds 30 KM, five (5) extra days will be allowed to complete inter-location movement for each 30 KM or part thereof beyond the initial thirty KM.

e) In case, inter-location movement is suspended due to Force Majeure situation, pursuant to Clause No.31.0 in Section-I under Part-3,the time lost on account of such Force Majeure condition may be extended without any liquidated damages/penalty/ loss to the Contractor.

f) In the event of delay in inter-location movement for the reason solely attributable to Contractor or their sub-contractor, the total ILM charges shall be discounted by five percent (5%) for delay of each day or part thereof beyond the standard allowable period as stipulated in (d) above, upto the total calculated cost for that inter-location movement.

6.0 ZERO (NIL) RATES

Notwithstanding any provision in the Contract, no charges shall be payable for the period, the job or activity assigned to the Contractor is halted due to break-down of Contractor's tools/equipment, non-availability of key personnel, non-

availability of chemicals & additives of adequate quality & quantity or for any other reason whatsoever attributable to the Contractor.

7.0 FORCE MAJEURE DAY RATE: (LUMP SUM PER DAY)

a) Upon occurrence of force majeure situation pursuant to Clause No. 31.0 of Section-I in Part-3 (GCC), only the Force Majeure Day Rate shall be payable by Company, which should be restricted to maximum fifty percent (50%) of the sum total of (i) Operational charges for Mud lab and equipment (Clause No. "3.0.1") and (ii) Operational charges for two mud engineers (Clause No. "4.0.1"). No other payment whatsoever will be due to the Contractor from Company under force majeure situation as above.

b) The Force Majeure Day Rate shall be payable per 24 hours a day or part thereof on pro-rata basis to the nearest half an hour during the first 15 (fifteen) days period of occurrence of force majeure situation only. No payment shall accrue to the Contractor beyond the first 15 (fifteen) days period unless mutually agreed upon.

c) Payment towards Force Majeure Day Rate shall not exceed 50% (Fifty percent) of the sum total of (i) Operational charges for Mud lab and equipment (Clause No. "3.0.1") and (ii) Operational charges for two mud engineers (Clause No. "4.0.1").

8.0 COST OF CHEMICALS/ADDITIVES: (ON ACTUAL CONSUMPTION BASIS)

a) The complete line of Mud Chemicals and additives required for the Services shall be supplied by the Contractor at site on FOR Destination (Rig site/Drilling location) basis including all applicable taxes & duties for effective & efficient Mud Engineering Services throughout the contract period.

b) The Contractor shall bear the entire cost of shipment/transportation up to well site, transit insurance, loading/unloading/handling charges, port rent/fees/ demurrage & other clearance charges as applicable, GST and all other statutory taxes & duties payable to statutory authorities.

c) Customs Duty: In terms of Sl. No. 404 of the Customs Notification No.50/2017-Cus dated 30.06.2017, imports of the items specified in List 33 (CONDITION NO. 48) of the Notification are subject to levy of concessional rate of customs duty @5% (BCD Nil & IGST@5%) subject to conditions specified therein (Condition No.48). However, this is subject to change as per Government guidelines and the provisions ruling at the time of tender closing will be applicable. Similarly, the domestic supply of such goods would attract 5% GST (i.e. IGST or CGST & SGST/UTSGT) on submission of EC in terms of GST Notification No.03/2017.

(i) Contractor shall provide the list of items to be imported by them under the Contract in the format specified in Proforma-A2 along with their bid for issuance of Recommendatory Letter to DGH. Contractor shall make a written request to Company immediately after shipment of the goods indicated by them in Proforma-A2, along with the Invoices and all shipping documents (with clear 20 working days' notice) requesting Company for issuance of

the Recommendatory Letter. OIL shall issue the Recommendatory provided all the documents submitted by the Contractor are found in order as per contract. It shall however be Contractor's responsibility to obtain EC from DGH and clear the goods through customs. OIL shall not be liable in whatsoever manner for the rejection of their claims for zero customs duty by any of the authorities including DGH arising solely as a result of any default on the part of the Contractor.

(ii) All imports and import clearances under the contract shall be done by the contractor and OIL shall not provide any assistance in this regard.

(iii) However, in the event customs duty becomes leviable during the course of contract arising out of a change in the policy of the Government, Company shall be liable for payment of the customs duties leviable in India on Contractor's items as provided in Proforma-A2 or the actual whichever is less (for the first time import) and at actuals (for subsequent imports), provided Contractor furnishes all necessary documents indicating the estimated customs duty at least 10 days in advance. Such payment of Customs Duty shall be arranged by Company and made available to the representatives of Contractor at Kolkata within 3 working days after Contractor submits the undisputed and clear necessary documents / duty assessment papers at Company's office at Kolkata. Contractor would be responsible for passing such payment to customs authorities at the port of entry. Company's obligation for Customs Duty payment shall be limited / restricted to the tariff rates as assessed by the Customs on the day of clearance, or as on the last day of the stipulated mobilization period. In case of clearance thereafter, on the CIF value of items in Proforma-A2 will be frozen and any increase in Customs Duty on account of increase in value on these will be to the Contractor's account. Furthermore, in case the above CIF value is not acceptable to assessing Customs Officer and as a result if any excess Customs Duty becomes payable, it shall be to Contractor's account. Before filing Bill of lading, Bill of entry, the Contractor must consult the Company to avoid payment of excess Customs Duty.

(iv) Contractor shall, however, arrange clearance of such items from Customs and port authorities in India and shall pay all requisite demurrages, if any, clearance fees/charges, port fees, clearing and forwarding agent fees/ charges, inland transport charges etc. Company shall provide all assistance by issuance of necessary letter of authority or other relevant documents and necessary help.

(v) Notwithstanding what is stated above, the bidders should also consider the position in regard to import of goods as specified in list No. 33 of above notification against concessional rate of 5% Customs Duty. OIL is not liable in whatsoever manner, for the rejection of their claims for concessional rate of 5%Customs Duty by any of the authorities including the DGH.

(vi) The bidder while quoting would need to consider the duty drawback as per notification No. 23/2008 dated 01.03.2008 available to them upon re-export of the equipment, if any. The bidder should also note that input tax credit would also be available to them on the IGST paid by them excluding duty drawback and this aspect should also be considered by them while quoting their rates.

(vii) Similarly, such specified goods required for petroleum operations if procured from domestic sources would attract5% concessional GST (IGST or CGST &SGST/UTGST) as per notification no. 3/2017 dtd. 28.06.2017 against issuance of EC by DGH for which OIL shall issue the recommendatory letter. Note: The recommendatory letter will be given only for those items which are either consumed during the execution of work or for those equipment/tools which are undertaken to be re-exported by the bidder. The recommendatory letter will not be issued when the bidder imports the equipment/tools on acquisition basis and does not undertake to re-export the same after the completion of the contract.

(viii) Contractor must ensure that the spares and consumables imported by them for providing the services under Contract are properly used in executing their job under the Contract in the PEL/ML areas of Company for which EC has been obtained. Contractor shall furnish to Company a certificate as and when the spares and consumables are used/consumed certifying that the spares and the consumables imported by them have been consumed in those ML and PEL areas under the contract for which Ecs were obtained by them. In order to avoid any misuse of the spares and consumables imported by the Contractor for providing the services under the Contract, Contractor shall furnish an Undertaking similar to that being furnished by Company to Customs of suitable amount before issue of the Recommendatory Letter.

d) In view of limited storing space at rig site, the Contractor shall maintain a supply base/warehouse/bulk storage facility in the vicinity of Rig site at their cost, from where the requirements will be fed regularly to the wells for uninterrupted operation. All related expenditures in this regard must be loaded with the quoted rates, no separate payments shall be made by the company for maintenance of supply base/warehouse or, bulk house.

e) Cost of Chemicals will be paid by Company against Contractor's monthly bill/invoice based on actual consumption in the wells as to be certified by Company's on-site Representative.

9.0 INTERIM DEMOBILIZATION/RE-MOBILIZATION CHARGES: (LUMP SUM) [For Personnel, Mud Lab. Equipment, Tools, Accessories etc.]

a) Mud lab with all equipment and accessories, personnel and well site chemicals shall be de-mobilized from the wellsite on interim basis by the Contractor within 03 (three) days from the date of issuance of interim demobilization notice. In such situation, Contractor shall be paid one time Interim De-mobilization and Interim Re-mobilization charges in lump sum. However, no other charges shall be payable after interim de-mobilization notice has been issued until the contractor on receipt of the notice from the company for remobilization, and re-mobilizes all its equipment, personnel, chemicals etc. to the wellsite, as certified by company representative for resuming operations.

b) Contractor shall re-mobilize required personnel including laboratory equipment, tools, and accessories for the next well within 12 (twelve) days from the date of interim re-mobilization notice.

GENERAL NOTES:

i) Bidders should categorically indicate name and address of their Indian agent and the percentage of commission involved in this contract, if any. Such agency commission should be included in the quoted rates. In case, no category confirmation in this regard is mentioned in the Bid, it will be construed that Indian agent commission is not involved and bids will be evaluated accordingly.

ii) Bidder should submit the list of items with CIF value to be imported into India in connection with execution of this contract as per PROFORMA-A2, enclosed. PROFORMA-A should also be included in the un-priced Techno-Commercial Bid incorporating therein the item description and quantity only. No cost detail should be shown in this PROFORMA while submitting with the Techno-commercial Bid. However, all the columns of this PROFORMA must be duly filled up for the items proposed to be imported (including Cement, Additives & Consumables) while submitting along with the PRICE BID.

iii) From the PROFORMA-A, bidder should identify the items of re-exportable in nature (i.e. items which will not be consumed during the execution of the contract and required to be exported outside India after completion of the contract). Total CIF value of such items should be shown in the "PRICE BID FORMAT" as CIF (RE-EX).

iv) Similarly from the PROFORMA-A2, bidder should identify the items of consumable in nature (i.e. items which will be consumed during the execution of the contract). Total CIF value of such items should be shown in the "PRICE BID FORMAT" as CIF (CONSUMABLES).

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PROFORMA-A

LIST OF ITEMS (Equipment, Tools, Accessories, Spares & consumable& Chemicals) TO BE IMPORTED IN CONNECTION WITH EXECUTION OF THE CONTRACT for MUD ENGINEERING SERVICES.

Sr No.	Item Description	Qty / Unit	Rate	Total	Freight & Insurance	CIF Value	Port & other charge	Landed Cost	Is it re-exportable? YES or NO	Year of Mfg.	HSN Code
A	B	C	D	E = C x D	F	G = F + E	H	I = G+ H	J	K	L

(1) **The items which are not of consumable in nature and required to be re- exported outside India after completion of the Contract should be indicated as "YES" in column "J".**

(2) **The items, which are of consumable in nature should be indicated as "NO" in column "J".**

(3) **For estimation of applicable customs duty, the bidders are required to indicate customs tariff code (i.e. HSN Code) of each item in column "L".**

Authorized Person's Signature: _____

Name: _____

Seal of the Bidder:

PROFORMA-B (Appendix-3 and 4)

PRICE BID FORMAT (MUD ENGINEERING SERVICE)

This Price Bid Format comprises of Appendix-3 (Cost of Services) and Appendix-4 (Cost of Chemicals) as shown below. Bidders are requested to quote rates against each item of both the Appendices. The price bids will be evaluated on the basis of rates quoted in these Appendices and will be compared on the total value basis (Appendix-3 + Appendix-4) for the Mud Engineering Services in totality including supply of Chemicals.

Appendix-3

FORMAT FOR COST OF MUD ENGINEERING SERVICES					
(PART-I) – COST OF SERVICES (MUD ENGINEERING OPERATION)					
Sl. No.	**Description of Services**	**UoM**	**Quantity (1)**	**Unit Rate in INR (excl GST) (2)**	**Total amount in INR (excl. GST) (3)=(1)x(2)**
1	**Charges for mobilisation**				
1(a)	Mobilisation Charges for the Mud Lab including all Lab equipment	Lumpsum	1		0.00
2	**Charges for Mud Lab with all equipment**				
2 (a)	Operational Charges for Mud Lab complete with all equipment	Day	465		0.00
2 (b)	Standby Charges for Mud Lab complete with all equipment	Day	100		0.00
3	**Charges for Personnel**				
3 (a)	Operational charges for Mud engineer (per engineer per day)	Man Day	930		0.00
3 (b)	Standby charges for Mud engineer (per engineer per day)	Man Day	200		0.00
4	**Charges during Inter-location Movement (ILM)**				
4 (a)	Lumpsum all inclusive rate upto initial 30 Km	Lumpsum	4		0.00
4 (b)	Rate per Km beyond 30 Km	Km	200		0.00
5	**Charges for Interim De-mobilisation and Re-mobilisation**				
5 (a)	Interim Demobilisation Charges for Mud lab including	Lumpsum	4		0.00

	all equipment, Personnels, chemicals etc				
5 (b)	Interim Re-mobilisation Charges for Mud lab including all equipment	Lumpsum	4		0.00
6	**Charges for De-mobilisation**				
6 (a)	Demobilisation Charges for Mud lab including all equipment, Personnels, chemicals etc	Lumpsum	1		0.00
Total estimated cost of Mud Engineering Services in 03 wells (including all taxes and duties except GST) in INR					**0.00**

GENERAL NOTES FOR Appendix-3:

1. The items referred above are to be read in conjunction with **PART- 3, Section-II, EXHIBIT-2 (B. Schedule of Rates).**
2. The Bid in which the rate for any of the above services is not quoted shall be rejected. However, if no charge is involved for any of the above work, 'NIL' should be mentioned against such services.

3. While quoting the rates in Table-A above, Bidders must adhere to the following restrictions.

a. Total Mobilization Charges quoted for Mud engineering services should not exceed 7.5% of the total contract value for the Mud engineering service part (Table-A + Table-B).
Total Demobilization Charges quoted should not be less than 2% the total contract value for the Mud engineering service part (Table-A + Table-B).

b. Force Majeure Day Rate must be restricted to maximum 50% of the sum total of Operational Day rate for Mud lab and equipment [Rate for item Sl. No. 2(a)] and Operational Day Rate for two Mud Engineers [2 x Rate for item Sl. No.3(a)].

4. The bidders are to quote above rates inclusive of all liabilities, except the GST.

5. The number of days and other parameters assumed above are only for the Bid evaluation purpose as assessed by Company. It is, however, to be clearly understood that payment will be made to the Contractor on the basis of actual number of days/parameters for which the equipment and crew are utilized during the currency of the Contract for job execution. The quoted Day Rates shall be paid in full per 24 hours a day, else on pro-rata to the nearest half an hour basis for part thereof.

6. Unit of measurement "Man-Day" shown above against Personnel Charges means charges per Mud Engineer per day of 24 hours at site.

7. Unless stated otherwise in the Bidding Documents, the Contract shall be for the whole works as described in Bidding Documents, based on the rates and prices submitted by the Bidder and accepted by the Employer. The price/rate(s) quoted by the Bidders will be inclusive of all taxes except

GST(i.e. IGST or CGST and SGST/UTGST applicable in case of interstate supply or intra state supply respectively and cess on GST , if applicable) on the final services. However, GST rate (including cess) to be provided in the respective places in the Price Bid.

8. Procurement of Specific Goods: Earlier, there is no tax incidence in case of import of specified goods. However, in terms of Sl. No. 404 of the Customs Notification No.50/2017-Cus dated 30.06.2017, imports of the items specified in List 33 of the Notification are subject to levy of concessional rate of customs duty @5% (BCD Nil & IGST @5%) subject to conditions specified therein (ConditionNo.48). Bidders should quote these GST component as inclusive considering IGST component for the imported Materials portion while quoting their prices on destination basis. However, GST rate to be specified in the price bid format.

9. Please note that as per Section 171 of the GST act [Anti-Profiteering Provisions Under the GST Law], it is mandatory to pass on the benefit due to any reduction in rate of tax or from input tax credit to the consumer by the way of commensurate reduction in price.

10. Price Bids shall be evaluated on overall lowest cost to OIL (L-1 offer) basis i.e. considering total quoted price for all services and Cost of Chemicals (Consumables per well) including GST (CGST & SGST/UTGST or IGST).

11. OIL will prefer to deal with registered bidder under GST. Therefore, bidders are requested to get themselves registered under GST, if not registered yet. However, in case any unregistered bidder is submitting their bid, their prices will be loaded with applicable GST while evaluation of bid. Where OIL is entitled for input credit of GST, the same will be considered for evaluation of bid as per evaluation methodology of tender document.

12. Price Bid without giving any of the details of the taxes (Including rates and amounts) will be considered as inclusive of all taxes including GST. When a bidder mentions taxes as extra without specifying the rates & amount, the offer will be loaded with maximum value towards taxes received against the tender for comparison purposes. If the bidder emerges as lowest bidder after such loading, in the event of contract/order on that bidder, taxes mentioned by OIL on the Purchase Order/ Contracts will be binding on the bidder.

13. Zero% Input Tax Credit on GST (Goods & Service Tax) is available to OIL & the same shall be considered for the Purpose of evaluation.

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Appendix-4

FORMAT FOR COST OF MUD ENGINEERING SERVICES										
(PART-II) COST OF CHEMICALS (MUD ENGINEERING OPERATIONS)										
Sl. No	**Mud Chemical Description**	**HSN Code**	**Brand Name**	**Country of origin**	**UoM**	**Qty (Y)**	**Unit Rate (in INR) (X)**	**Total Cost of Chemicals excl GST (in INR) (Z= X*Y)**	**Specs enclosed (Yes/No)**	**MSDS enclosed (Yes/No)**
1	Bentonite				MT	280		0		
2	Caustic Soda				KG	19000		0		
3	Barytes				MT	1300		0		
4	CMC (High viscous grade)				KG	12000		0		
5	CMC (Low viscous grade)				KG	22000		0		
6	PAC -R				KG	18000		0		
7	PAC-L				KG	18000		0		
8	Linseed Oil				LIT	26000		0		
9	EP-Lube				LIT	9000		0		
10	Shale Stabiliser (Magcophasol)				KG	9500		0		
11	Encapsulating Polymer (PHPA)				KG	10500		0		
12	XC-Polymer				KG	12000				
13	Accretion Inhibitor (Drilling Detergent)				LIT	9500		0		
14	Glycol/Polyol				LIT	75000		0		
15	Calcium Carbonate (MCC)				KG	10000		0		
16	Formalin/ Biocide				LIT	8000		0		
17	Octyl Alcohol/ Defoamer				LIT	6000		0		

18	Sodium Formate				KG	420000		0		
19	Mica				KG	10000		0		
20	Cellophane flakes				KG	10000		0		
21	Saw Dust				KG	8000		0		
22	Wall Nut Shell (Medium)				KG	8000		0		
23	Oxygen Scavenger				KG	3900		0		
24	Pipe Lax/ Spotting Fluid				LIT	5500		0		
25	H2S Scavenger				KG	2000		0		
26	Sodium Bicarbonate				KG	2000		0		
27	Teepol				LIT	800		0		
28	Acid Sodium Pyrophosphate				KG	1300		0		
29	Corrosion Inhibitor (Amine Based)				LIT	1000		0		
30	Soda Ash				KG	2500		0		
31	Potassium Sulphate				KG	65000		0		
32	NIF				KG	21000		0		
33	Potassium Chloride				KG	150000				
Total estimated Cost of Chemicals for Mud Engineering Services (including all taxes and duties excluding GST) in INR								-		

GENERAL NOTES FOR APPENDIX-4:

1.0 The bidder shall quote single rate for each above chemical, which are required to be supplied by them on FOR Destination (Rig Site) basis for use in Tripura under the contract. Quoted rates must include cost of the materials, packing & forwarding Charges, taxes & duties as applicable (**except GST**), shipment & transportation cost upto well sites in Mizoram, transit insurance and storing, warehousing & handling costs, if any, etc. as applicable.

2.0 In addition to above Chemicals, the Bidders may also separately quote for any proposed alternative chemical with total chemical requirements, other than the above, as may be envisaged for well in Tripura, but strictly as per above format (cost per Ltr./Barrel/Kg/MT). However, to ascertain inter-se-ranking of bidders, evaluation of their Bids will be done strictly as per chemicals mentioned in Table-B above.

3.0 Chemical names shown above are generic in nature. The bidder may quote for equivalent/substitute chemicals with proper technical literatures and justification. Bidders are requested to offer single rate against each item. In case any bidder offers multiple substitutes indicating rate of each thereof under Table-B above, the highest rate quoted amongst the substitute items will be taken for bid evaluation and Bidders' ranking will be determined accordingly for award of contract. However, in the event of award of contract, Company will have the right to select any of the substitutes for use at the quoted rate only.

4.0 Quoted rates must be net of all discounts (Digressively if offered will not be considered for financial evaluation of the bids).

5.0 Quantity shown above against each item for completion of one well is as tentatively assessed by Company for the purpose of bid evaluation only. However, the actual requirement may vary during the drilling operation and payment will be made on the basis of actual consumption in the wells.

6.0 B i d d e r must quote the rate schedule strictly as above instead of referring to their standard price list.

7.0 Unless stated otherwise in the Bidding Documents, the Contract shall be for the whole works as described in Bidding Documents, based on the rates and prices submitted by the Bidder and accepted by the Employer. The price/rate(s) quoted by the Bidders will be inclusive of all taxes except GST(i.e. IGST or CGST and SGST/UTGST applicable in case of interstate supply or intra state supply respectively and Cess on GST , if applicable) on the final services. However, GST rate (including cess) to be provided in the respective places in the Price Bid.

8.0 Procurement of Specific Goods: Earlier, there is no tax incidence in case of import of specified goods. However, in terms of Sl. No. 404 of the Customs Notification No.50/2017-Cus dated 30.06.2017, imports of the items specified in List 33 of the Notification are subject to levy of concessional rate of customs duty @5% (BCD Nil & IGST @5%) subject to conditions specified therein (Condition No.48). Bidders should quote these GST component as inclusive considering IGST component for the imported Materials portion while quoting their prices on destination basis. However, GST rate to be specified in the price bid format.

9.0 Please note that as per Section 171 of the GST act [Anti-Profiteering Provisions Under the GST Law], it is mandatory to pass on the benefit due to any reduction in rate of tax or from input tax credit to the consumer by the way of commensurate reduction in price.

10.0 Price Bids shall be evaluated on overall lowest cost to OIL (L-1 offer) basis i.e. considering total quoted price for all services and Cost of Chemicals (Consumables for 03 wells) including GST (CGST & SGST/UTGST or IGST).

11.0 OIL will prefer to deal with registered bidder under GST. Therefore, bidders are requested to get themselves registered under GST, if not registered yet. However, in case any unregistered bidder is submitting their bid, their prices will be loaded with applicable GST while evaluation of bid. Where OIL is entitled for input credit of GST, the same will be considered for evaluation of bid as per evaluation methodology of tender document.

12.0 Price Bid without giving any of the details of the taxes (Including rates and amounts) will be considered as inclusive of all taxes including GST. When a bidder mentions taxes as extra without specifying the rates & amount, the offer will be loaded with maximum value towards taxes received against the tender for comparison purposes. If the bidder emerges as lowest bidder after such loading, in the event of contract/order on that bidder, taxes mentioned by OIL on the Purchase Order/ Contracts will be binding on the bidder.

13.0 Zero percent Input Tax Credit on GST (Goods & Service Tax) is available to OIL & the same shall be considered for the Purpose of evaluation.

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