OIL INDIA LIMITED

(A GOVT. OF INDIA ENTERPRISE)
CONTRACTS DEPARTMENT, DULIAJAN
DISTRICT: DIBRUGARH (ASSAM), PIN-786602
TEL: (91) 374-2800548, FAX: (91) 374-2803549
E-mail ID: contracts@oilindia.in
Website: www.oil-india.com

AMENDMENT NO. 7 DATED 10.06.2020 TO TENDER NO. CDG3506P20 FOR HIRING OF HIGH PERFORMANCE WATER BASE MUD (HPWBM) SERVICES WITH CENTRIFUGE SYSTEM (CALL OUT BASIS) FOR DRILLING OF WELLS WITH SUPPLY OF SPECIAL CHEMICALS AND MUD ENGINEERING EXPERT.

This Amendment to Tender No. **CDG3506P20** is issued to notify the following:

1. Amendment to tender clauses are stipulated vide **Exhibit-I** attached herewith.

2. The original Price Bid Format (Proforma - B & B1) stands replaced with **Revised Price Bid Format (Revised Proforma – B & B1)** attached under 'Notes and Attachments' tab in OIL's e-Tender portal.

3. **Annexure-VII** as referred in the note under Clause A.6.0 of Part-2 (Bid Evaluation Criteria) of the tender document is attached herewith.

4. **Clause No. 37.0** (PURCHASE PREFERENCE POLICY-LINKED WITH LOCAL CONTENT) of **Part-1 (Instructions to Bidders)** of the tender document stands replaced with the clause mentioned in Exhibit-II attached herewith.

5. Bid Closing & Opening dates are amendment as below:

   Bid Closing date & Time: 25th June 2020 [11:00 Hrs (IST)]
   Bid Opening date & Time: 25th June 2020 [14:00 Hrs (IST)]

All other Terms and Conditions of the Tender/Bid Document (Considering all previous Amendments/Addendums, if any) will remain unchanged.

Sd/-
(B. Brahma)
Sr. Manager – Contracts
For Chief General Manager – Contracts

EXHIBIT-I

Amendments to Clauses of IFB No. CDG3506P20 for Hiring of High Performance Water Based Mud services with Centrifuge System

Sl. No.	Tender Clause No.	Original Clause	Proposed Amendment
PART-2: BID EVALUATION CRITERIA			
1	A. 1.0 (iii) (page 27)	Bidder should submit documentary evidence including all information of Contract(s) / invoice / job carried out by them in support of above experience criteria (i) & (ii) along with the bid.	Bidder should submit documentary evidence including all information of Contract(s) / invoice / job carried out by them in support of above experience criteria (i) & (ii) along with the bid ***in Annexure-A.1***
2	A. 1.0 (vii) (page 28)	The bidder should confirm to mobilize their required Chemicals, Centrifuge, consumables, personnel etc. within **90 (ninety)** days from the date of issuance of mobilization notice after issuance of LOA. **Note on Mud chemicals**: Contractor shall arrange to make the mud Chemicals available in well site in staggered manner depending on well requirement in lots in consultation with Company after award of contract. However, delivery of the mud chemicals on behalf of OIL shall be arranged in such a way that mud Chemicals arrive at site are ready for use in operation without any stoppage to the work. However, in the event of stoppage to the work on account of contractor, due to shortage/non-delivery of the mud chemicals at site within the required schedule, company will have the right to recover the consequential losses due to stoppage of work.	The bidder should confirm to mobilize their required Chemicals, Centrifuge, consumables, personnel etc. within ***120 (one hundred twenty)*** days from the date of issuance of mobilization notice after issuance of LOA. **Note on Mud chemicals**: Contractor shall arrange to make the mud Chemicals available in well site in staggered manner depending on well requirement in lots in consultation with Company after award of contract. However, delivery of the mud chemicals on behalf of OIL shall be arranged in such a way that mud Chemicals arrive at site are ready for use in operation without any stoppage to the work. ~~*However, in the event of stoppage to the work on account of contractor, due to shortage/non-delivery of the mud chemicals at site within the required schedule, company will have the right to recover the consequential losses due to stoppage of work.*~~

3	A.2.0 (ii) (page 28)	All the documents, certificates, information in support of meeting above criteria must be submitted along with the technical bid.	All the documents, certificates, information in support of meeting above criteria *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) must be submitted along with the technical bid, such as:* *Job Completion certificate / Performance Report / Job cards issued by the clients* *(OR)* *Proof of release of Performance Security after completion of the Contract.* *(OR)* *Proof of settlement / release of final payment against the Contract* *(OR)* *Any other documentary evidence that substantiates the satisfactory execution of each of the Contracts cited above.*
4	A.3.1 (ix) (page 29)	Payment shall be made by OIL only to the leader of the consortium towards fulfilment of contract obligations.	**NO CHANGE**
5	D.6.0 (ii) (page 36)	The quantities mentioned against each item in Schedule of Rate / Price Bid Format are for evaluation purposes only, **payment will be made at actual consumption**.	The quantities mentioned against each item in Schedule of Rate / Price Bid Format are for evaluation purposes only, **payment will be made *on the basis of actuals***. *The payment for the freshly prepared mud volume in each section shall be made on the basis of cost per bbl rate. However, the payment for the cost of additional/extra chemicals incurred during the actual field condition will be made on the basis of actual consumption.*

6	E.4.0 (page 36)	**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 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.	**NO CHANGE**
PART-3; SECTION-I; GENERAL CONDITIONS OF CONTRACT			
7	2.2 (page 39)	**MOBILISATION TIME:** After issuance of LOA, Contractor shall mobilize consumables, personnel, tools and equipment required for the services. Mobilization shall be treated as completed when all the consumables, personnel, tools and equipment for High Performance Water based Mud and centrifuge service are mobilized at least for the first well and are ready for commencement of Operation. The mobilization shall be completed by Contractor within 90 days from the date of Mobilization notice issued by the Company.	**MOBILISATION TIME:** After issuance of LOA, Contractor shall mobilize consumables, personnel, tools and equipment required for the services. Mobilization shall be treated as completed when all the consumables, personnel, tools and equipment for High Performance Water based Mud and centrifuge service are mobilized at least for the ***first two (02) wells*** and are ready for commencement of Operation. The mobilization shall be completed by Contractor within ***120 days*** from the date of Mobilization notice issued by the Company.
8	2.2; Note (i) (page 40)	Mobilization/ Re-Mobilization/ Interim Re-Mobilization shall be treated as completed when all the consumables including Mud Engineers for High Performance Water based Mud service are mobilized to the designated site and ready for commencement of work after certification by OIL personnel.	Mobilization/ Re-Mobilization/ Interim Re-Mobilization shall be treated as completed when all the consumables including Mud Engineers for High Performance Water based Mud service are mobilized to the designated site and ready for commencement of work after certification by OIL personnel. *Mobilization will be treated as completed when all the operating tools/ equipment/ chemicals/ consumables are received and tools/ equipment are commissioned / tested/ calibrated to its rated specifications to the satisfaction of OIL along with operating crew*

			at the designated first drilling location.
9	2.2; Note (iii) (page 40)	The contractor shall submit purchase document/ bill of landing/ custom assessed invoice/ packing list etc. which clearly show the FOB & CIF values. For indigenous items, if any, contractor may submit the copy of relevant purchasing document. Also, the resume of persons to be engaged under the contract shall be produced before mobilization.	**DELETED**
10	6.2 (page 42)	Should Company discover at any time during the tenure of the Contract or till completion of demobilization of tools and personnel after issuance of demobilization notice/expiry of Contract that the Work does not conform to the foregoing warranty, Contractor shall after receipt of notice from Company, promptly perform any and all corrective work required to make the services conform to the Warranty. Such corrective Work shall be performed entirely at Contractor's own expenses. If such corrective Work is not performed within a reasonable time, the Company, at its option may have such remedial Work performed by others and charge the cost thereof to Contractor, which the Contractor must pay promptly. In case Contractor fails to perform remedial work, or pay promptly in respect thereof, the performance security shall be forfeited.	**NO CHANGE**
11	7.5 (page 43)	However, the above obligation shall not extend to information which: i) is, at the time of disclosure, known to the public which Contractor shall immediately inform Company; ii) is lawfully becomes at a later date known to the public through no fault of Contractor subject to Contractor's undertaking that no information has been divulged by them to the public; iii) is lawfully possessed by Contractor before receipt thereof from Company which should be immediately informed to Company; iv) is developed by Contractor independently of the information disclosed by Company which should be shared with the Company; v) Contractor is required to produce before competent authorities or by court order subject to prior permission from Company;	**NO CHANGE**

12	10.8 (page 49)	Contractor shall obtain additional insurance or revise the limits of existing insurance as per Company's request in which case additional cost shall be to Contractor's account.	Contractor shall obtain additional insurance or revise the limits of existing insurance as per Company's request in which case additional cost shall be to ~~*Contractor's*~~ ***Company's*** account.
13	13.7 (page 50)	Notwithstanding any provisions herein to the contrary, the Contract may be terminated at any time by the company on giving 15 (fifteen) days written notice to the Contractor due to any other reason not covered under the above clause from 13.1 to 13.6 and in the event of such termination the Company shall not be liable to pay any cost or damage to the Contractor except for payment of services as per the Contract upto the date of termination.	Notwithstanding any provisions herein to the contrary, the Contract may be terminated at any time by the company on giving 15 (fifteen) days written notice to the Contractor due to any other reason not covered under the above clause from 13.1 to 13.6 and in the event of such termination the Company shall not be liable to pay any cost or damage to the Contractor except for payment of services as per the Contract upto the date of termination ***including de-mobilisation cost if any*****.**
14	18.1 (page 54)	Time is the essence of this Contract. In the event of the Contractor's default in timely mobilization for commencement of operations within the stipulated period, the Contractor shall be liable to pay liquidated damages @ 0.5% of total contract value including mobilization cost, per week or part thereof of delay subject to maximum of 7.5%. Liquidated Damages will be reckoned from the expiry date of the scheduled mobilisation period as defined in Clause No. 2.2 of Section-I.	Time is the essence of this Contract. In the event of the Contractor's default in timely mobilization for commencement of operations within the stipulated period, the Contractor shall be liable to pay liquidated damages @ 0.5% of total contract value including mobilization cost, per week or part thereof of delay subject to maximum of 7.5%. Liquidated Damages will be reckoned from the expiry date of the scheduled mobilisation period as defined in Clause No. 2.2 of Section-I. ***GST, if applicable shall be on Contractor's account***.
15	22.3 (page 55)	The Contractor hereby agrees to waive its right of recourse and further agrees to cause its underwriters to waive their right of subrogation against Company and/or its underwriters, servants, agents, nominees, assignees, Contractors and sub-contractors for loss or damage to the equipment of the Contractor and/or its sub-contractors and/or their employees when such loss or damage or liabilities arises out of or in connection with the performance of the contract limited to	**NO CHANGE**

		the Contractor's liabilities agreed to under this Contract.	
16	22.4 (page 56)	The Contractor hereby further agrees to waive its right of recourse and agrees to cause its underwriters to waive their right of subrogation against Company and/or its underwriters, servants, agents, nominees, assignees, Contractors and sub-contractors for injury to, illness or death of any employee of the Contractor and of its contractors, sub-contractors and/or their employees when such injury, illness or death arises out of or in connection with the performance of the contract limited to the Contractor's liabilities agreed to under this Contract.	**NO CHANGE**
17	22.5 (page 56)	Except as otherwise expressly provided, neither Contractor nor its servants, agents, nominees, Contractors or sub-contractors shall have any liability or responsibility whatsoever to whomsoever for loss of or damage to the equipment and/or loss or damage to the property of the Company and/or their Contractors or sub-contractors, irrespective of how such loss or damage is caused and even if caused by the negligence of Contractor and/or its servants, agents, nominees, assignees, Contractors and sub-contractors. The Company shall protect, defend, indemnify and hold harmless Contractor from and against such loss or damage and any suit, claim or expense resulting there from.	**NO CHANGE**
18	22.6 (page 56)	Neither Contractor nor its servants, agents, nominees, assignees, Contractors, sub-contractors shall have any liability or responsibility whatsoever to whomsoever for injury or illness, or death of any employee of the Company and/or of its Contractors or sub-contractors irrespective of how such injury, illness or death is caused and even if caused by the negligence of Contractor and/or its servants, agents, nominees, assignees, Contractors and sub-contractors. Company shall protect, defend indemnify and hold harmless Contractor from and against such liabilities and any suit, claim or expense resulting there from.	**NO CHANGE**

PART-3; SECTION-II; TERMS OF REFERENCE/SPECIFICATIONS/SCOPE OF WORK			
19	6.0 (page 64 & 65)	**SCOPE OF WORK**: The Contractor is required to provide Mud Engineering Services in totality with supply of special chemicals for two (02) years, extendable by one (01) year (if required). The contractor shall provide one unit of mud engineering service for operating in selected drilling locations. However, back to back wells may not be available for requirement of continuous mud services and hence there might be a time gap between two wells. The proposed High Performance Water Base Mud (HPWBM) system should be able to address the borehole instability and differential pressure regimes (Max 3000 psi) leading to frequent held up / reaming, high torque & drag, bit balling, multiple pipe stucks, hole washout/cavings etc. The scope of centrifuge service shall be on call out basis at the discretion of OIL. If the proposed HPWBM is selected for use in a well where the rig infrastructure is not equipped with centrifuge unit, then the contractor's centrifuge service shall be utilized. Based on the operational requirement, subjected to additional candidate wells for utilization of HPWBM, OIL may decide to hire second set of mud engineering service. Accordingly, contractor has to mobilize the second set of mud engineering service within 45 days from date of notice by OIL. The scope of work includes but not limited to: • Mud Engineering Service. • Designing and formulation of mud program. • Supply of all special mud chemicals and additives. • Provide centrifuge and its spare parts / consumables etc. (call out basis). • Supply of laboratory equipment, reagent and consumables etc.	**SCOPE OF WORK**: The Contractor is required to provide Mud Engineering Services in totality with supply of special chemicals for two (02) years, extendable by one (01) year (if required). The contractor shall provide one unit of mud engineering service for operating in selected drilling locations. However, back to back wells may not be available for requirement of continuous mud services and hence there might be a time gap between two wells. The proposed High Performance Water Base Mud (HPWBM) system should be able to address the borehole instability and differential pressure regimes (Max 3000 psi) leading to frequent held up / reaming, high torque & drag, bit balling, multiple pipe stucks, hole washout/cavings etc. The scope of centrifuge service shall be on call out basis at the discretion of OIL. If the proposed HPWBM is selected for use in a well where the rig infrastructure is not equipped with centrifuge unit, then the contractor's centrifuge service shall be utilized. Based on the operational requirement, subjected to additional candidate wells for utilization of HPWBM, OIL may decide to hire second set of mud engineering service. Accordingly, contractor has to mobilize the second set of mud engineering service within ***60 days*** from date of notice by OIL. The scope of work includes but not limited to: • Mud Engineering Service. • Designing and formulation of mud program. • Supply of all special mud chemicals and additives. • Provide centrifuge and its spare

			parts / consumables etc. (call out basis). • Supply of laboratory equipment, reagent and consumables etc.
20	6.2; TABLE-A(ii) (page 66)	Special specifications for HPWBM	**DELETED**
21	6.2 (i) (page 66)	Based on the geological data provided by OIL and well engineering, contractor shall design/formulate High Performance Water Base Mud (HPWBM) and hydraulic program for each phase. The mud formulation should contain desired concentration of special chemicals like CP Glycol, Polyamine, Accretion Inhibitor and Encapsulating polymer in addition to other normal chemicals / additives. Contractor shall provide the Mud Engineering services for the Mud system approved by OIL.	Based on the geological data provided by OIL and well engineering, contractor shall design/formulate High Performance Water Base Mud (HPWBM) and hydraulic program for each phase. The mud formulation ***must*** contain desired concentration of special chemicals like CP Glycol ***(Clouding temp. 85-90 degC)***, Polyamine, Accretion Inhibitor and Encapsulating polymer in addition to other normal chemicals / additives. Contractor shall provide the Mud Engineering services for the Mud system approved by OIL.
22	6.2 (ii) (page 66)	The proposed mud formulation shall meet the mud parameters for each section as per Table A (i) and Table A (ii).	The proposed mud formulation shall meet the mud parameters for each section as per Table A (i). ***Moreover, during the execution of the contract OIL reserves the right to collect mud sample randomly for assesing its performance and parameters at OIL's central chemical laboratory.***
23	6.2 (vii) (page 67)	Contractor should plan for requirement of any other extra special chemicals to maintain desired mud parameters during actual field condition. However, the extra cost incurred during the process should be borne by the contractor.	Contractor should plan for requirement of any other extra special chemicals to maintain desired mud parameters during actual field condition. However, ***the payment for the cost of additional/extra chemicals incurred during the actual field condition will be made on the basis of actual consumption.***

24	6.2; Note (i) (page 67)	In case of drilling of 12 ¼" and 8 ½" hole section in a particular well using the same HPWBM, the left over mud of 12 ¼" hole shall be used in drilling of 8 ½" hole after treating the mud with required chemicals and which shall meet the mud rheology of 8 ½" hole section.	In case of drilling of 12 ¼" and 8 ½" hole section in a particular well using the same HPWBM, the left over mud of 12 ¼" hole shall be used in drilling of 8 ½" hole after treating the mud with required chemicals and which shall meet the ***desired mud parameters of 8 ½" hole section. However, the payment for the cost of extra chemicals required for meeting the desired mud parameters of 8 ½" hole section will be made on the basis of actual consumption.***
25	6.3 (page 67)	**TECHNICAL BACK-UP SUPPORT OF SOFTWARE AND LABORATORY STUDIES**: Contractor shall provide assistance of all supporting software for rheology and hydraulics control under dynamic temperature and pressure conditions for drilling of wells. Contractor shall get testing and analysis of chemicals/bulk materials done and provide detailed results, if required. Contractor shall carry out detailed laboratory studies for shale characterization of core samples/drill cuttings to optimize mud system for progressive refinements from time to time. All the findings of the studies have to be submitted to OIL. The detailed studies on shale characterization to be carried out at least once in a well.	**TECHNICAL BACK-UP SUPPORT OF SOFTWARE AND LABORATORY STUDIES**: Contractor shall provide assistance of all supporting software for rheology and hydraulics control under dynamic temperature and pressure conditions for drilling of wells. Contractor shall get testing and analysis of chemicals/bulk materials done and provide detailed results, if required. Contractor shall carry out detailed laboratory studies for shale characterization of core samples/drill cuttings to optimize mud system for progressive refinements from time to time. All the findings of the studies have to be submitted to OIL. The detailed studies on shale characterization to be carried out ***free of cost once during the course of contract. However, OIL may ask the contractor to carry out more such studies on chargable basis. In this regard, bidder shall quote the charges accrodingly in the bid, which shall not be considered for bid evaluation***.
26	6.4 (viii) (page 68)	The contractor shall deploy a co-coordinator at their base in Duliajan having technical experience to liaise with OIL's chemist/representatives on a regular basis.	The contractor shall deploy a co-coordinator at their base in Duliajan having technical ***knowledge*** to liaise with OIL's chemist/representatives on a regular basis.

27	6.5 (i) (page 68 & 69)	The Contractor shall supply of all special chemicals/additives conforming to relevant API/BIS specifications required for preparation and maintenance of mud**.** The contractor shall maintain adequate stock of their chemicals and ensure timely supply as per operational requirement of the well for uninterrupted services. However, the payment will be made on actual consumption basis duly certified by OIL chemist/company representative. OIL will provide a skid mounted godown of size 24 ft x 8.5 ft or civil godown with bamboo structure at site for storing chemicals brought in by the contractor. However housekeeping / maintenance of the storage space at site is solely contractor's responsibility. Contractor shall have to arrange warehouse / storage facility at their base in Duliajan (or in around Duliajan) for storage of their chemicals/additives etc.	The Contractor shall supply of all special chemicals/additives conforming to relevant API/BIS specifications required for preparation and maintenance of mud. The contractor shall maintain adequate stock of their chemicals and ensure timely supply as per operational requirement of the well for uninterrupted services. ***The payment will be made on the basis of cost per bbl for freshly prepared mud for each section meeting the mud parameters as per SOW. However, the payment for the cost of additional/extra chemicals incurred during the actual field condition will be made on the basis of actual consumption certified by OIL chemist/company representative. Specifications of some chemicals as per API/BIS/OIL standard are given below.*** OIL will provide a skid mounted godown of size 24 ft x 8.5 ft or civil godown with bamboo structure at site for storing chemicals brought in by the contractor. However housekeeping / maintenance of the storage space at site is solely contractor's responsibility. Contractor shall have to arrange warehouse / storage facility at their base in Duliajan (or in around Duliajan) for storage of their chemicals/additives etc.
28	6.5 (vii) (page 69)	The contractor shall provide product datasheet for each chemical including but not limited to brand name, unit of packing, country of origin, specification and Material Safety Data Sheet (MSDS). The contractor shall provide information on complete list of chemicals as per **Table-I.**	The contractor shall provide product datasheet for each chemical including but not limited to brand name, unit of packing, country of origin, specification and Material Safety Data Sheet (MSDS). The contractor shall provide information on complete list of chemicals as per Table-I. *Bidders are requested to submit an undertaking clearly stating that they will supply Chemicals as per the specification mentioned in the tender. This undertaking has to be submitted along with the techno-commercial bid. The specifications of each chemical should reflect the*

			relevant parameters of that particular additive and indicate its performance required in the test report.
29	6.5 (x) (a) (page 70)	Since the mud system will be used in environmentally sensitive areas, the chemicals supplied by the contractor shall be biodegradable, eco-friendly and within tolerable toxicity limit.	Since the mud system will be used in environmentally sensitive areas, the ***composite mud system provided by the contractor*** shall be biodegradable, eco-friendly and within tolerable toxicity limit.
30	6.5 (xiii)	**NEW CLAUSE**	***Specification of Some Chemicals****:* *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 in* ***ATTACHMENT-I*** *enclosed. Samples of chemicals collected from the well site must conform to these specifications. Contractor must provide the test report of their special chemicals from a recognized laboratory for quality of supplied chemicals.*
31	6.6 (i) (page 70)	All the necessary drilling fluid testing equipment/ glass wares, chemicals/ reagents and consumables for testing of mud as per API / AIDC standards including any special tests for estimation of glycol, amine, PHPA, HPHT fluid loss, lubricity coefficient, bacteria count etc. shall be provided by the contractor as per table II. OIL will provide a skid mounted laboratory bunk house at rig site with the facilities like water connection and electrical power supply for setting up the same.	All the necessary drilling fluid testing equipment/ glass wares, chemicals/ reagents and consumables for testing of mud as per API / AIDC standards including any special tests for estimation of glycol, amine, PHPA, HPHT fluid loss, lubricity coefficient, ~~bacteria count~~ etc. shall be provided by the contractor as per Table II. OIL will provide a skid mounted laboratory bunk house at rig site with the facilities like water connection and electrical power supply for setting up the same.

32	6.8 (page 70)	**POLLUTION AND CONTAMINATION**: The Contractor shall be liable for all surface pollution to the extent caused by Contractor and resulting from spillage / dumping of mud or rubbish in any form or dumping of solvents/ additive substances or pollutants which the Contractor brings to the site for use in connection with Work to be performed under this Contract. However, in the event of such dumping or spillage or discharge by Contractor, Contractor shall immediately assume all responsibility at their cost for the removal of items, substances or rubbish so dumped or discharged and for any resulting pollution on surface or contamination in any form, at the well site. OIL will dispose contractor's empty sacks and drums from well site.	**POLLUTION AND CONTAMINATION:** The Contractor shall be liable for all surface pollution to the extent caused by Contractor and resulting from spillage ***of additives / substances which the Contractor brings to the site for use in connection with Work to be performed under this Contract. However, in the event of such spillage by the Contractor, Contractor shall immediately assume all responsibility at their cost for the removal of items, substances.*** OIL will dispose contractor's empty sacks and drums from well site.
33	6.9 (i) (page 70)	Centrifuge service shall be hired on call out basis only.	Centrifuge service shall be hired on call out basis only ***if the centrifuge is not available at the selected rig. In such case, Company will issue a formal order and contractor has to mobilize the unit at pre-agreed rates within 90 (Ninety) days.***
34	6.9 (iii) (page 71)	Contractor shall have sole responsibility for installation/commissioning and dismantling of the centrifuge in each well along with operation & maintenance of the same. However, crane service and other assistance like welder / fabricator etc. will be provided by OIL. Contractor shall provide all necessary spare parts / consumables etc. required for running the system for entire period of contract.	Contractor shall have sole responsibility for installation/commissioning and dismantling of the centrifuge in each well along with operation & maintenance of the same. However, crane service and other assistance like welder / fabricator etc. will be provided by OIL. Contractor shall provide all necessary spare parts / consumables etc. required for running the system for entire period of contract. ***However, materials & consumables required for fabricating / welding jobs will be provided by OIL.***
35	6.10 (i) (page 71)	Contractor shall provide one (01) Centrifuge operator on round the clock basis.	Contractor shall provide ***two (02)*** Centrifuge operator on round the clock basis.

36	6.11 (page 71)	**MUD POLICY & MUD FORMULATION**: Mud formulation and policy for 100pcf mud (13.4ppg) HPWBM system to be suggested by Contractor. The bidders should submit detailed mud formulation along with test results duly signed by authorized signatory in the bid. The mud formulations and test results submitted in the bid shall be tested/evaluated at the bidder's respective laboratories in presence of OIL's representatives during the technical evaluation of the bid. If the test results of bidder's proposed mud formulation during testing do not meet with the test results and formulation submitted in bid, the bid will be rejected. However, 10% variation of test results will be allowed for acceptance. The test results so generated will be final & binding.	**MUD POLICY & MUD FORMULATION**: Mud formulation and policy for ***78.5pcf (10.5 ppg) for 12.25" section and 100pcf (13.4ppg) for 8.5" section of*** HPWBM system to be suggested by Contractor. The bidders should submit detailed mud formulation along with test results duly signed by authorized signatory in the bid ***for each sections***. The mud formulations and test results submitted in the bid shall be tested/evaluated at the bidder's respective laboratories in presence of OIL's representatives during the technical evaluation of the bid. If the test results of bidder's proposed mud formulation during testing do not meet with the test results and formulation submitted in bid, the bid will be rejected. However, 10% variation of test results will be allowed for acceptance. The test results so generated will be final & binding.
37	6.12; TABLE-I; FULL LIST OF PRODUCTS; SL. NO.12 (page 73)	CaCO3 (different sizes)	**CaCO3** ***(0 & 325)***
PART-3; SECTION-III; SPECIAL CONDITIONS OF CONTRACT			
38	2.0 (page 78)	**ASSOCIATION OF COMPANY'S PERSONNEL/ KNOWLEDGE OF FIELD PERSONNEL & CONDUCT**: The contractor shall work in close liaison with company's representative (s) for operation and related matters. Company's representative (s) shall have free access to all tools/consumables/equipment for the purpose of inspection/ observation at any time as he/they feels/feel necessary. The contractor field personnel (Mud Engineers and centrifuge operators) shall be fluent in English language and should have complete knowledge of proposed High Performance Water Base Mud (HPWBM) system and its maintenance. All the contractor personnel should be amiable while	**ASSOCIATION OF COMPANY'S PERSONNEL/ KNOWLEDGE OF FIELD PERSONNEL & CONDUCT**: The contractor shall work in close liaison with company's representative (s) for operation and related matters. Company's representative (s) shall have free access to all tools/consumables/equipment for the purpose of inspection/observation at any time as he/they feels/feel necessary. The contractor field personnel (Mud Engineers and centrifuge operators) shall be fluent in English language and should have complete knowledge of

		dealing with any of the company's personnel. Company shall serve notice for any deficiency of personnel engaged by contractor and contractor shall have to replace him at short notice. The contractor shall deploy competent Mud Engineers required for High Performance Water Base Mud (HPWBM) service as indicated in para IV of Terms of Reference. All data collected would be confidential and contractor is not to part with any other contractor or operator.	proposed High Performance Water Base Mud (HPWBM) system and its maintenance. All the contractor personnel should be amiable while dealing with any of the company's personnel. Company shall serve notice for any deficiency of personnel engaged by contractor and contractor shall have to replace him ***within one week***. The contractor shall deploy competent Mud Engineers required for High Performance Water Base Mud (HPWBM) service as indicated in para IV of Terms of Reference. All data collected would be confidential and contractor is not to part with any other contractor or operator.
39	3.1 (page 78)	**Mud Engineers & Centrifuge Operator**: In case the operations/services need to be temporarily suspended due to unforeseen reasons, contractor shall be advised to pause of service (part or full) at discretion of the company. In such situation contractor shall be paid Interim de-mobilization charges. Re-mobilization charges shall be payable when OIL notifies to do so. At discretion of the company, Interim de-mobilization and Re-mobilization may be applicable once or number of times. After completion of a well, de-mobilization notice shall be issued to Mud Engineers if felt necessary by OIL. Similarly, re-mobilization notice shall be issued to Mud Engineers for the next well and charges demobilization and remobilization to be paid accordingly. In case the next well gets ready within ten(10) days for taking up the contractor mud services after completion of the previous well, no de-mobilization notice shall be issued and stand by charges shall be payable for those days. No operating or standby day rate is payable from the time of interim de-mobilization notice is issued till re-mobilization is completed against Company's request.	**Mud Engineers & Centrifuge Operator**: In case the operations/services need to be temporarily suspended due to unforeseen reasons, contractor shall be advised to pause of service (part or full) at discretion of the company. In such situation contractor shall be paid Interim de-mobilization charges. Re-mobilization charges shall be payable when OIL notifies to do so. At discretion of the company, Interim de-mobilization and Re-mobilization may be applicable once or number of times. After completion of a well, de-mobilization notice shall be issued to Mud Engineers if felt necessary by OIL. Similarly, re-mobilization notice shall be issued to Mud Engineers for the next well and charges demobilization and remobilization to be paid accordingly. In case the next well gets ready within ten (10) days for taking up the contractor mud services after completion of the previous well, no ***intermediate*** de-mobilization notice shall be issued.

		Interim demobilization (single or more personnel at the discretion of OIL) will be applicable with immediate effect from the time & date of notification by OIL and remobilization (single or more personnel at the discretion of OIL) at the designated site is to be completed within 07 (seven) days from the time & date of notification by OIL.	No operating or standby day rate is payable from the time of interim de-mobilization notice is issued till re-mobilization is completed against Company's request. Interim demobilization (single or more personnel at the discretion of OIL) will be applicable with immediate effect from the time & date of notification by OIL and remobilization (single or more personnel at the discretion of OIL) at the designated site is to be completed within 07 (seven) days from the time & date of notification by OIL.
40	3.2 (page 78 & 79)	**LAB EQUIPMENT AND ACCOMMODATION BUNK HOUSE**: In case the operations/services need to be **temporarily suspended** due to unforeseen reasons, contractor shall be advised to pause of service (part or full) at discretion of the company. In such situation contractor shall be paid Interim de-mobilization and Re-mobilization charges for lab equipment with reagents and accommodation bunk house when OIL notifies to do so.	**NO CHANGE**
41	7.1 (page 79 & 80)	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). 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.	**NO CHANGE**
42	7.3 (page 80)	All imports and import clearances under the contract shall be done by the contractor and OIL shall not provide any assistance in this regard.	All imports and import clearances under the contract shall be done by the contractor and OIL shall ~~not~~ provide ~~any~~ assistance in this regard.

43	10.3 (page 83)	Contractor shall never spill any chemical/liquids/oils etc. at well site. In the event of such spillage, same shall be collected/ lifted and disposed off immediately. Should there be any pollution from such spillage; liability for compensation thereof shall be contractor's responsibility.	Contractor shall never spill any chemical/liquids/oils etc. at well site. In the event of such spillage, same shall be collected/ lifted and disposed off immediately. ~~*Should there be any pollution from such spillage; liability for compensation thereof shall be contractor's responsibility.*~~
44	10.13 (page 84)	Any compensation arising out of the job carried out by the Contractor whether related to pollution, Safety or Health will be paid by the contractor only.	Any compensation arising out of the job carried out by the Contractor whether related to pollution, Safety or Health will be paid by the contractor only ***subject to clause 10.4***.
45	17.4 (page 87)	Contractor shall furnish to Company details of all chemicals to be brought in to India four (4) weeks in advance of the date of shipment. These details shall include date of purchase, name of manufacturer / supplier, make, serial number, specifications, country of origin etc. Contractor will be fully responsible for any unauthorized imports or wrong declaration of goods and will have to pay the penalty and other consequences as levied by the port / custom authorities for such unauthorized imports. Contractor shall bear all expenses on account of any damages/loss, non-performance during the course of operation.	Contractor shall furnish to Company details of all chemicals to be brought in to India four (4) weeks in advance of the date of shipment. These details shall include date of purchase, name of manufacturer / supplier, make, serial number, specifications, country of origin etc. Contractor will be fully responsible for any unauthorized imports or wrong declaration of goods and will have to pay the penalty and other consequences as levied by the port / custom authorities for such unauthorized imports. Contractor shall bear all expenses on account of any damages/loss, non-performance during the course of operation ***provided such damage/loss is attributable to Contractor's fault***.
46	18.7 (page 88)	Payment of invoices, if undisputed, shall be made within 30 days following the date of receipt of invoice by Company excepting for the first 2(two) monthly invoices where some delay (up to one month) may occur.	Payment of ***monthly*** invoices, if undisputed, shall be made within 30 days following the date of receipt of invoice by Company excepting for the first 2(two) monthly invoices where some delay (up to one month) may occur.

47	18.8 (page 88 & 89)	Company shall within 20 days of receipt of the invoice notify the contractor of any item under dispute, specifying the reasons thereof, in which event, and payment of the disputed amount may be withheld until settlement of the dispute, but payment shall be made of any undisputed portion on or before the due date. This will not prejudice the company's right to question the validity of the payment at a later date as envisaged in Clause 18.3 above.	Company shall within ~~20~~ ***30 days*** of receipt of the invoice notify the contractor of any item under dispute, specifying the reasons thereof, in which event, and payment of the disputed amount may be withheld until settlement of the dispute, but payment shall be made of any undisputed portion on or before the due date. This will not prejudice the company's right to question the validity of the payment at a later date as envisaged in Clause 18.3 above.
48	18.10 (page 89)	Payments of other invoices as set forth in Clause 18.4 shall be made within 60 days following the date of receipt of the invoices by Company.	Payments of other invoices as set forth in Clause **18.5** shall be made within ~~60~~ ***45 days*** following the date of receipt of the invoices by Company.
49	18.11 (page 89)	Payment of mobilization charges shall be made within 30 days following the date of receipt of undisputed invoices by Company. Mobilization should be complete in all respect before raising invoice.	Payment of mobilization charges shall be made within ~~30~~ ***45 days*** following the date of receipt of undisputed invoices by Company. Mobilization should be complete in all respect before raising invoice.
50	18.12 (page 89)	Payment of demobilization charges shall be made when applicable within 30 days following receipt of invoice by Company accompanied by the following documents from the contractor:	Payment of demobilization charges shall be made when applicable within ~~30~~ ***45 days*** following receipt of invoice by Company accompanied by the following documents from the contractor:
51	22.0	**NEW CLAUSE**	**LIABILITY FOR THE WELL OR RESERVOIR:** Notwithstanding anything else contained herein to the contrary, the Contractor shall not be liable or responsible for or in respect of: i) Any sub-surface damage (including but not limited to damages or loss of a well or reservoir or formation, the loss of any oil or gas there from), or any surface loss or damage or injury or death arising out of a sub-surface damage; and/or ii) Blowout, fire, explosion or any other uncontrolled well condition; and/or iii) Damage to, or loss of oil or gas from any pipelines, vessels or

			storage or production facilities; and/or iv) Any loss or damage or injury or death whatsoever, direct or consequential, including liability arising from pollution originating below the surface and any clean-up costs, whether caused by their personnel or Equipment or otherwise arising from or in any way connected with such sub-surface Operations or in performing or attempting to perform any such Operations; v) third party liabilities arising out of the above irrespective of the cause and the Company agrees that it shall absolve the Contractor and protect, defend, indemnify and hold the Contractor and its sub-contractors, its agents and its parents, subsidiaries and affiliates, its other contractors and/or its and their directors, officers, employees, consultants and invitees harmless from and against all claims, suits, demands and causes of actions, liabilities, expenses, costs and judgments of every kind and character (including without limitation for the loss or damage of any property, or the injury or death of any person), without limit, in favour of any person, party or entity, resulting from any of the above, including costs incurred by Company in this respect.

52	23.0	**NEW CLAUSE**	**IP INFRINGEMENT:** Contractor shall indemnify and hold the Company harmless from any third party claims arising on account of intellectual property infringement with respect to its services or products except where such infringement is caused due to: (a) Specific modification or design of Contractor's equipment or Services to meet Company's specifications, (b) Combination of Contractor's equipment or Services in combination of other equipment and/or services not recommended by Contractor, (c) Out of unauthorized additions or modifications of Contractor's equipment or services by Company, or (d) Company's use of Contractor's equipment or Services that does not correspond to Contractor's published standards or specifications; in which case, the Company shall indemnify and hold the Contractor harmless.
53	24.0	**NEW CLAUSE**	**Based on the operational requirement, subjected to additional candidate wells for utilization of HPWBM, OIL may decide to hire second set of mud engineering service at mutually agreed rates but not more than the original rates.**
PART-3; SECTION-IV; SCHEDULE OF RATES			
54	A (b) (page 91)	Mobilization will be completed when all the operating tools/equipment/ chemicals/consumables are received and tools/equipment are commissioned /tested/calibrated to its rated specifications to the satisfaction of OIL along with operating crew at the designated drilling location.	Mobilization will be completed when all the operating tools/ equipment/ chemicals/ consumables are received and tools/ equipment are commissioned / tested/ calibrated to its rated specifications to the satisfaction of OIL along with operating crew at the designated ***first*** drilling location.

55	C (a) (page 92)	Standby Charges will be payable per 24 hours a day (pro-rata basis for part thereof up to the completed full hours only) and will be applicable against temporary halt of operations due to rig repair/rig standby/rig shutdown etc. leading to suspension of mud laboratory services continuously for more than 48 hours. However, for the initial consecutive 48 hours of suspension of mud laboratory services under such condition, the normal day rate as per **Para: B** above will be payable on pro-rata. No standby day rate will apply beyond the initial 48 hours till resumption of the services.	Standby Charges will be payable per 24 hours a day (pro-rata basis for part thereof up to the completed full hours only) and will be applicable against temporary halt of operations due to rig repair/rig standby/rig shutdown etc. leading to suspension of mud laboratory services continuously for more than 48 hours. However, for the initial consecutive 48 hours of suspension of mud laboratory services under such condition, the normal day rate as per **Para: B** above will be payable on pro-rata. ~~*No standby day rate will apply beyond the initial 48 hours till resumption of the services.*~~
56	C (b) (page 92)	Standby Charges for the unit will be payable during dismantling of the unit in one location, Inter Location Movement (ILM) and re-installation / re-commissioning of the unit in next location.	***No standby Charges for the unit will be payable once the Inter Location Movement (ILM) notice is served by OIL till re-installation / re-commissioning of the unit in next location.***
57	C (d)	**NEW CLAUSE**	*Standby charge will be applicable for the period from the date of complete mobilization of MUD LABORATORY EQUIPMENT to the date of start of mud preparation.*
58	F (I) (b) (page 93)	In case the next well gets ready within ten(10) days for taking up the contractor mud services after completion of the previous well, no de-mobilization notice shall be issued and stand by charges shall be payable for those days.	In case the next well gets ready within ten (10) days for taking up the contractor mud services after completion of the previous well, no ***intermediate*** de-mobilization notice shall be issued ~~*and stand by charges shall be payable for those days*~~.
59	G (I) (c) (page 93)	In case the next well gets ready within ten(10) days for taking up the contractor mud services after completion of the previous well, no de-mobilization notice shall be issued and stand by charges shall be payable for those days.	**DELETED**

60	H (page 94)	**INTERLOCATION MOVEMENT (ILM) CHARGES**: Contractor will be solely responsible for executing Inter-Location Movement that covers shifting of contractor's chemicals, laboratory equipment / consumables / personnel deployed by the contractor. Depending on the distance between the locations, separate rates will be applicable as mentioned below: (a) Fixed Charge (lumpsum) per rig move upto 100 Km. (b) Kilometerage charges for ILM in excess of 100 Km. This will be in addition to lumpsum rate for ILM upto 100 Km as mentioned in 'a' above.	**INTER LOCATION MOVEMENT (ILM) CHARGES**: (For Mud Lab Equipment, Accessories, 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 upto a maximum distance of one hundred (100) KM. (ii) All-inclusive Rate per KM for the distance beyond initial hundred (100) KM. Wherever, the distance between two locations for inter-location movement exceeds 100 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 or 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 six (06) days from the date of ILM notice issued by the Company upto an inter-location distance of one hundred (100) KM. In case the distance between two locations exceeds 100 KM, four (04) extra days will be allowed to complete inter-location movement. e) In case, inter-location movement is suspended due to Force Majeure situation, pursuant to **Clause No. J in Section-IV under Part-3**, the time lost on account of such Force Majeure condition will 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.

61	K (I) (c) (page 95)	Operational Charges shall be payable for Centrifuge for running period only. The running period of the unit shall have to be certified by the company's official.	Operational Charges shall be payable for centrifuge ***when the centrifuge is put on operation during drilling and circulation***. The running period of the unit shall have to be certified by the company's official.
62	K (II) (a) (page 95)	Standby Charges will be payable per 24 hours a day (pro-rata basis for part thereof up to the completed full hours only) and will be applicable against temporary halt of operations due to rig repair/rig standby/rig shutdown etc. leading to suspension of centrifuge services continuously for more than 48 hours. No standby day rate will apply beyond the initial 48 hours till resumption of the services.	Standby Charges will be payable per 24 hours a day (pro-rata basis for part thereof up to the completed full hours only) and will be applicable when the centrifuge unit is not in operation.
63	K (II) (c) (page 95)	**NEW CLAUSE**	Standby Charges for the unit will be payable during dismantling of the unit in one location, Inter Location Movement (ILM) and re-installation / re-commissioning of the unit in next location.
64	K (III) (page 96)	a) Operational Charges for centrifuge operator per 24 hours a day (pro rata basis for part thereof up to the completed full hours only) basis. The contractor shall deploy one (01) Centrifuge Operator on round the clock basis. b) Operational day rate for centrifuge personnel shall be payable only for running period of the centrifuge. No operational day rate shall be paid while the centrifuge unit is not in use.	a) Operational Charges for centrifuge operator per 24 hours a day (pro rata basis for part thereof up to the completed full hours only) basis. The contractor shall deploy ***two (02)*** onsite Centrifuge Operator ***for round the clock monitoring***. b) Operational day rate for centrifuge personnel shall be payable only for running period of the centrifuge. No operational day rate shall be paid while the centrifuge unit is not in use ***and standby charges will be applicable***.

65	K (IV) (page 96)	a) Standby Charges will be payable per 24 hours a day (pro-rata basis for part thereof up to the completed full hours only) and will be applicable against temporary halt of operations due to rig repair/rig standby/rig shutdown etc. leading to suspension of centrifuge services continuously for more than 48 hours. However, no standby charges will apply beyond the initial 48 hours till resumption of the services. b) Standby charges for centrifuge operator shall not be applicable while the unit is not in use. (Except Clause E, point (b) above).	a) Standby Charges will be payable per 24 hours a day (pro-rata basis for part thereof up to the completed full hours only) and will be applicable when the centrifuge unit is not in use.
66	L (i) (page 96)	Standby charges for mud engineers shall be payable for the Inter Location Movement (ILM) period of maximum 06 days only. If the next location is not ready for ILM/Operations, interim demobilization- remobilization notice shall be issued and charges shall be paid accordingly.	**DELETED**
67	M	**NEW CLAUSE**	**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, Mud lab equipment, Centrifuge, non-availability of key personnel, non-availability of chemicals & additives of adequate quality & quantity or for any other reason whatsoever attributable to the Contractor.*

ATTACHMENT-I

SPECIFICATION OF SOME CHEMICALS

A. 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, 95.00 % by mass, minimum.

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 rigours of transit and storage.

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

5. Marking: 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
   iv) Supply order number against which the supply is made.

B. Clay Encapsulating/Viscosifying Agent 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 deg C, % 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+/- 5 deg 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, and minimum: 9

ii) After aging at 110 deg C 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 for 15 minutes so that no lumps are left after the stirring period. Age the suspension at 26 +/- 2 deg C 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 deg C.

   i) Apparent viscosity should be 15 cp minimum Age the suspension at 110 deg C for 24 hrs in rolling condition. After the ageing period cool and stir for 15 minutes in multimixer. Measure apparent viscosity of the suspension at 26 +/- 2 deg C.
   ii) Decrease of apparent viscosity 20% max. of 8(i).

9. Calcium tolerance: Prepare a 0.4% (w/v) suspension of the PHPA 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 in 100 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:

   i) The material should be packed in multiwall paper bags with at least two innermost layers suitably water proofed, strong enough to with stand rigours of transit and storage. Capacity 25 kgs net per bag.
   ii) PELLETIZATION:-If supply is from foreign source, the supply should be in suitably pelletized forms.

11. 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
   iv) Supply order number against which the supply is made.

C. Fluid Loss Control / Viscosifier / Encapsulating Agent 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 gms of LR grade NaCl in 100 ml distilled water) and measure apparent viscosity at 26 +/- 2 Deg C 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 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 100ml distilled water) and calculate the yield of the sample which should be as follows.

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

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

6. Degree of Substitution, minimum: 1.00

7. Performance Test:

   A. <u>In Fresh Water mud</u>

   i) Preparation of base mud

   Prepare a 10 % (w/v) suspension of OIL 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 Deg C. 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 Deg C which should be as follows:

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

   ii) Preparation of treated mud:

   Treat the base 7A(i) with 0.5% polyanionic cellulose (R) 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)
(c) 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 Deg C 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. <u>In Salt Water Mud</u>:

i) Preparation of base mud:

Prepare 10 % (w/v) bentonite suspension of OIL 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 Deg C After the lapse of aging period, cool and and add 4% (w/v) NaCl (LR grade) and age for 24 hrs. at 26 +/- 2 Deg C. 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 Deg C which should be as follows:

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

Treat the base mud prepared as per the 7B(i) with 0.5%(w/v) polyanionic cellulose (R) sample and stir in a multimixer for 30 minutes. Performance at 26 +/- 2 Deg. C. Determine apparent viscosity, yield value and API fluid loss of mud 7B (ii) above at 26 +/- 2 Deg C 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)
(c) API fluid loss, ml maximum: 15 % of 7B(i,c)

8. Packing:

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

   ii) PELLETIZATION:-If supply is from foreign source, the supply should be in suitably pelletized forms.

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
   iv) Supply order number against the supply made.

   N.B: 1) Apparent viscosity and yield point shall be determined in 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.

D. FLUID LOSS CONTROL AGENT
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 deg C, % by mass, maximum: 15.00 at 105+/- 2

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 deg C 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% salt water (prepared by dissolving 4 gms of LR rade 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 cellusose content, on dry basis, % by mass, (on dry basis), minimum: 85.00

6. Degree of substitution, minimum: 1.00

7. Performance test:

A. <u>In fresh water mud</u>:

i) Preparation of base mud:

Prepare a 10.0% (w/v) suspension of OIL 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 deg C. 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% 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 deg C which should be as follows:

(a) Apparent viscosity, cp: 15-20
(b) Yield value, lbs/100 ftsq: To determine
(c) 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 deg C

Measure apparent viscosity, yield value and API fluid loss of one part of the treated mud 7A(ii) at 26+/-2 deg C 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
(c) API fluid loss, ml, max. : 50% of 7A,ic

Performance at 120+/-2 deg C

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 deg C 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
(c) API luid 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 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 deg C. After the lapse of the aging period, cool and add 4% NaCl (w/v) (LR grade) and age for 24 hrs. at 26+/-2 deg C. 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 deg C which should be as follows:

(a) Apparent viscosity, cp: 15 - 20
(b) Yield value, lbs/100 ftsq: To determine
(c) 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 30 minutes in a multimixer.

Performance at 26+/-2 deg C

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
(c) API fluid loss, ml, max.: 15% of 7B, ic

8. Packing:

i) The material should be packed in multi-walled paper bags with at least two innermost layers suitably water proofed, strong enough to with stand rigours of transit and storage.

ii) PELLETIZATION:-If supply is from foreign source, the supply should be in suitably pelletized forms.

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
iv) Supply order number against which the supply is made.

N.B.: 1) Apparent viscosity will be measure by a Fan VG meter and API fluid loss will 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.

E. XC POLYMER- DISPERSIBLE (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 a 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 for 30 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 deg C which should be as follows:

   i) Apparent viscosity, cp : 15 – 25
   ii) "0" minute gel, lbs/100 ftsq., minimum: 8
   iii) "N" value at 200 & 100 rpm of Fann VG meter or equivalent, maximum: 0.40

   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 0.2% (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 at 26 +/- 2 deg C 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

5. 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 with 1N NaOH solution. Add to it 3% of the OIL approved bentonite powder and stir for 30 minutes. Determine apparent viscosity, yield value and API fluid loss of the mud at 26 +/- 2 deg C. Age the treated mud at 100 +/- 2 deg C 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 deg C 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

6. 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 1N NaOH solution. Record apparent viscosity and yield value of suspension at 26 +/- 2 deg C.

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

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

7. 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.

8. Packing:

   i) The material should be packed in multiwalled paper bags with at least two innermost layers are suitably water proofed strong enough to withstand rigours of transit and storage. Pack Size: 25KG net per bag.
   ii) PELLETISATION:-If supply is from foreign source, the supply should be in suitably pelletised forms.

9. 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
   iv) Supply order number against which the supply is made.

N.B. 1) Apparent viscosity and yield value will be measured by a Fann VG meter or equivalent and API fluid loss will 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.

F. <u>Pre-gelatinized Starch</u>:

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, cP: 10.0 (Max)

5. Qualitative Test for Presence of Starch: Positive

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

7. Performance Test:

   a) In Fresh Water Mud:

      i) Prepare Base Mud using OIL 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 30 minutes using laboratory stirrer (5000 - 6000 rpm) and aged for 72 hours 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. Record Apparent Viscosity and API Filtration Loss of the fresh water base mud.

      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 7(a)(i).

(b) In Salt Water Mud:

i) Prepare 10.0% (w/v) Bentonite Suspension in Distilled Water from OIL 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) and 0.35% (w/v) Sodium Bicarbonate (AR/GR grade). Stir for 15 minutes at high speed in Hamilton Beach Mixer and age it for 24 hours 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) of the Salt Water Base Mud at 24 ± 2° C.: Record Apparent Viscosity and API Filtration Loss of the salt water base mud.

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 not be 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 rigours 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
d) Supply order number against which supplies are made

G. Micronized Calcium Carbonate:

Physical properties:

1. Physical State-Fine Powder free from dirt & foreign matter.
2. Water soluble content-0.35 %(by weight) max.
3. Specific gravity at 24+/-2degC -2.6(min).
4. Purity as Calcium Carbonate-96% by weight min.
5. Solubility in 15% wt/wt HCl-96% by weight min.

6. Particle size distribution % by volume as measured by light scattering technology- D10- < 4 micron; D50- 4-15 micron; D90-15-60 micron. Particle retain on 200 meshes ASTM- 2% by weight max.

Packing: Moisture proof HDPE/Jute bag with polythene inner lining (100 gauge) strong enough to withstand rigours of transit and storage, capacity 50 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
d) Supply order number against which supplies are made

H. Soda Ash (Sodium Carbonate):

1. Physical State: The material as received should be in powder form free from dirt and foreign matter and should be easily soluble in water.

2. Volatile Matter, determined by: 2.00 heating at 250-300 Deg. C for 1 hr., percent by mass, max.

3. Purity as $Na_2(CO)_3$, after : 98.50 removing the volatile matter, percent by mass, min.

4. Packing: The material should be packed in D.W. jute bag with an insert of polythene bag. The material should be supplied in the original packing of the manufacturer. Capacity 25 kgs/50 kgs per bag.

5. Markings: Each bag should have clear legible markings as follows :

(i) Name of the product
(ii) Name of the supplier/manufacturer
(iii) Date/Month/Year of manufacture
(iv) Supply order number against which the present supply is made

I. 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 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 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 deg C. 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 30 minutes in a multi-mixer. 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 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 deg C. After lapse of 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 deg C. 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 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 deg C. 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 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 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 deg C. After lapse againg 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 sleve. 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 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 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 carbuoys with leak tight stopper and screw caps. Each carbuoys should be covered with wooden crate strong enough to withstand rigours of transit and storage. 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
   iv) Supply order number against which the supply is made.

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

J. POLYAMINE

Specification:

1. Physical Properties: The material as received shall be in the form of colourless/pale yellow liquid and shall be free from visible impurities. Should be determined visually.

2. Miscibility with Water at 24 ± 2 Deg C:
   Prepare a 2% (v/v) of the sample solution in distilled water, which gives a clear single phase solution.
   Miscibility with Water at 24 ± 2 Deg C should be completely miscible.

3. Miscibility with 3% KCL solution at 24 ± 2 Deg C:
   Prepare a 2% (v/v) of the sample solution in 3%kcl solution, which gives a clear single phase solution.
   Miscibility with 3% KCL solution at 24 ± 2 Deg C should be completely miscible.

4. Specific Gravity at 24 ± 2 Deg C: It should be between 1.01-1.1.

5. Qualitatively determine Na+, K+ and Ca++ in 2%
   CHS/Polyamine in distilled water: All three elements absent.

6. Chemical assay (Reinecke salt gravimetric method) :< = 20.0 % By mass.

7. Swelling test: 2% (w/v) solution of the sample by Linear Swell Meter against Bentonite pellets compressed to 10,000 psi in a 2 hrs test: < =24.0 %.

8. Clay Hydration Suppression

   a) Base Mud
   Take 450ml of distilled water and add 45 g of bentonite powder and stir the mixture in silverson High Shear mixture for 30 minutes at medium speed. Determine apparent viscosity at 24 +/- 2 degC which should be as follows:

   Specification: Apparent Viscosity, cp: To determine.

   b) Treated Mud:
   Take 450ml of distilled water and add 45 g of bentonite powder, and stir the mixture in silverson High Shear mixture, and add 2% (w/v) of the sample and stir for 30 minutes at medium speed. Determine apparent viscosity at 24 +/- 2 degC which should be as follows.

   Specification: Apparent Viscosity, cp: Should not be more than 15% of the base mud.

9. Methylene Blue Capacity

   a) Base Mud
   Hydrate 20g/350ml bentonite in distilled water for 24 hours at room temperature. Take 2 ml of the slurry add 5ml of Distilled water and stir in mixer for 30 min. Record the methylene blue capacity with the help of methylene blue solution.
   Specification: Methylene blue Capacity, ml: to determine

   b) Treated Mud
   Hydrate 20g/350ml bentonite in distilled water for 24 hours at room temperature. Take 2 ml of the slurry add 5ml of Distilled water, add 5ml of 2% amine solution in distilled water and stir in mixer for 30 min. Record the methylene blue capacity with the help of methylene blue solution (as mentioned in sub procedure ChemLab/Mud/sub/MBC/06.

   Specification: Methylene blue Capacity, ml: 65% (max) of bentonite slurry.

   Packing: The material should be packed in 200 Kg plastic Jar/Drum strong enough to withstand rigors of transportation and storage.

Marking:

Each drum shall have clear legible marking as given below:

a) Name of the product:
b) Name of the supplier:
c) Date/Month/ year of manufacture.
d) Supply order number against which supplies are made: "

&&&&&&&&&&

ANNEXURE-A.1

Experience of Vendors/Contractors/Service Providers

(Details of jobs completed during last seven years preceding the bid closing date)

Sl. No.	Contract No.	Name & contact details of client	Place of operation	Services Offered	Wells drilled & completed		Commencement date of contract	Completion date of contract
					No. of Well(s)	Depth of Well		

(Add lines as required)

ANNEXURE-VII

[On company's Letter Head]

To,

M/s OIL INDIA LIMITED (OIL)
CONTRACTS DEPARTMENT
DULIAJAN, ASSAM, INDIA, PIN-786602

Dear Sir,

This has reference to your Tender No. ..... dated ..... 20___ on the subject .....

We.....(Name of the Company) confirm that we will engage/deploy the services including the key personnel of the Technical collaborator/ Subsidiary/Parent company/Joint Venture Partner experience (strike out whichever are not applicable) on whose strength we are meeting the tender's Technical requirement as per the tender qualifying criteria.

Signature
(Name & Designation of Authorized person)

&&&&&&&&&&&&&

EXHIBIT-II

CLAUSE NO. 37.0 [PURCHASE PREFERENCE POLICY-LINKED WITH LOCAL CONTENT (PP - LC)] OF PART-1 (INSTRUCTIONS TO BIDDERS) OF THE TENDER SHOULD BE READ AS BELOW:

37.1 Vide Letter No. FP-20013/2/2017-FP-PNG dated 07.10.2019, MoPNG has notified Amended Govt. Policy for providing Purchase Preference linked with Local Content (PP-LC) in all PSUs under MoPNG for awarding a specified percentage of tender quantity to the lowest techno-commercially qualified LC Bidder, subject to meeting certain conditions as stipulated in the Policy.

37.2 The said Policy shall be applicable in ICB Tenders for procurement of Goods, Services and EPC Contracts pertaining to Oil & Gas business activities as mentioned at Enclosure-I of the Policy document. However, the Policy shall not be applicable for HP-HT operations for the time being.

37.3 In case a bidder is eligible to seek benefits under PP-LC policy as well as Public Procurement Policy for MSEs-Order 2012, then the bidders should categorically seek benefits against only one of the two policies i.e. either PP-LC or MSE policy. If a bidder seeks EMD exemption under the MSE policy, then it shall be considered that the bidder has sought benefit against the MSE policy and this option once exercised cannot be modified subsequently. Tenders involving eligible/qualified MSME Vendors as well as LC Vendors, preference regarding placement of order shall be accorded to MSME Vendors in line with Public Procurement Policy over PP-LC Policy.

37.4 Bidders seeking Purchase Preference under PP-LC Policy shall be required to meet / exceed the target of Local Content (LC) as on the date of NIT issued by OIL and mandated vide Enclosure-I to the policy notification (Letter No. FP-20013/2/2017-FP-PNG dated 07.10.2019 including the latest amendment thereto, if any).

37.4.1 Such bidders shall furnish following undertaking on its letter head along with their techno-commercial bid. The undertaking shall become a part of the contract.

"We _____ (Name of the bidder) undertake that we meet the mandatory minimum Local Content (LC) requirement i.e. _____ (to be filled as notified at Enclosure I of the policy) for claiming purchase preference linked with Local Contents under the Govt. policy against under tender no. _____."

The percentage of local content in the bid is _____%".

37.4.2 **In cases of procurement for a value in excess of Rs 10 crores;** above undertaking shall be supported by the following certificate from Statutory Auditor engaged by the bidder or Cost Auditor of the company (in the case of companies) or from a practising cost accountant or practicing chartered accountant (in respect of suppliers other than companies), on the letter head of such Statutory Auditor etc.

"We _____ the statutory auditor (or as the case may be) of M/s _____ (name of the bidder) hereby certify that M/s_____ (name of the bidder) meet the mandatory Local Content requirements of the Services i.e. _____ (to be filled as

notified at Enclosure I of the policy) quoted vide offer No._____ dated _____ against OIL's Tender No._____ by M/s _____ (Name of the bidder).

The percentage of local content in the bid is _____%".

NOTE: In case of foreign bidder, certificate (with regard to the fulfilment of minimum mandatory local content requirement) from the Statutory Auditor or Cost Auditor of their own office or subsidiary in India giving the percentage of local content is also acceptable. In case, office or subsidiary in India does not exist or Indian office/ subsidiary is not required to appoint Statutory Auditors or Cost auditors, certificate from practicing cost accountant or practicing Chartered Accountant in India or practicing cost accountant in India shall also be acceptable.

37.4.3 At the bidding stage the bidder shall provide undertaking, certificate as per provisions under clause 4.1 and 4.2 above.

Sample format for calculation of LC may be seen in Enclosure-III of PP-LC Policy. Bidders confirmation on LC shall be based on the calculation shown in this enclosure. However, this enclosure shall not be required to be included in the bid or uploaded by the bidder in the e-procurement portal in case of e-tender.

37.5 Eligible (techno-commercially qualified) LC bidder shall be granted a Purchase Preference of 10% i.e. where the evaluated price is within 10% of the evaluated lowest price of Non-Local Content (NLC) bidder, other things being equal. Accordingly, Purchase Preference shall be granted to the eligible (techno-commercially qualified) LC bidder concerned, at the lowest valid i.e. NLC price bid.

37.5.1 Only those LC bidders whose bids are within 10% of the NLC L1 bid would be allowed an opportunity to match with L1 bid. All the eligible LC bidders shall be asked to submit their confirmation to match their price in sealed envelopes. Envelopes of the bidders shall be opened and award shall be made to the lowest evaluated TA/CA (Techno-Commercially Acceptable) bidder among the eligible LC bidders. In case the lowest eligible LC bidder fails to match L1 price, the next eligible LC bidder will be awarded the prescribed quantity and so on. In case none of the eligible LC bidders matches the L1 bid, the actual bidder holding L1 price will secure the order.

37.6 Order for supply of 50% of the tendered quantity would be awarded to the lowest techno-commercially qualified LC bidder, subject to matching with valid NLC L1 price. The remaining will be awarded to L1 (i.e. NLC bidder). Prescribed 50% tendered quantity for LC bidders shall not be further sub-divided among eligible LC bidders.

37.6.1 However, if L1 bidder happens to be a LC bidder, the entire procurement value shall be awarded to such bidder.

37.6.2 When the tendered goods/services cannot be divided in the exact ratio of 50% / 50%, then OIL reserves the right to award on lowest eligible PP-LC bidder for quantity not less than 50%, as may be divisible.

For example:

In case tendered quantity is 3 Nos. (not divisible in the ratio of 50:50), PP-LC bidder shall get order for 2 Nos. only and the rest will go to L-1 (NLC bidder).

OR

(Alternate clause applicable for cases where tendered quantity cannot be divided).

37.7 The tendered quantity is not splitable / non-dividable / cannot be procured from multiple sources. Hence, the entire procurement value shall be awarded to the lowest techno-commercially qualified LC bidder subject to matching with valid NLC L1 rates.

37.8 All terms used herein above shall be interpreted/governed by the definitions provided at para 2.0 of the policy document notified by MoPNG vide letter No. FP-20013/2/2017-FP-PNG dated 07.10.2019.

37.9 The successful bidder shall be obliged to fulfill the requirements of quality and delivery time in accordance with the provisions of the Purchase order/contract. OIL shall have the right to satisfy itself of the production capability and product quality of the manufacturer.

37.10 **Determination of LC:**

37.10.1 LC of Services shall be calculated on the basis of the ratio of service cost of domestic component in service to the total cost of services.

37.10.2 The total cost of service shall be constituted of the cost spent for rendering of service, covering:

a) Cost of component (material), which is used.
b) Manpower and consultant cost, cost of working equipment/facility, and
c) General service cost, excluding profit, company overhead cost, taxes and duties

37.10.3 The criteria for determination of cost of local content in the service shall be as under:

a) In the case of material being used to help the provision of service, based on country of origin.
b) In the case of manpower and consultant based on INR component of the services contract.
c) In the case of working equipment/facility, based on country of origin and
d) In the case of general service cost, based on the criteria as mentioned in clauses a, b and c above.
e) Indian flag vessels in operation as on date.

37.10.4 Determination of Local Content: The determination of local content of the working equipment/facility shall be based on the following provision.

Working equipment produced in the country is valued as 100% (one hundred percent) local content, working equipment produced abroad is valued as much as nil (0% percent) local content.

37.11 Calculation of LC and Reporting

37.11.1 LC shall be calculated on the basis of verifiable data. In the case of data used in the calculation of LC being not verifiable, the value of LC of the said component shall be treated as NIL.

37.11.2 Formats for the calculation of LC of services may be seen at Enclosure-III of the policy document.

37.12 Certification and Verification

37.12.1 Bidder seeking Purchase Preference under the policy, shall be obliged to verify the LC of services as follows:

37.12.1.1 **At bidding stage:**

a) Local Content:
   (i) The bidder shall provide the percentage of Local Content in the bid as per provisions under clause No. 4.3 above.
   (ii) Bidder must have LC in excess of the specified requirement.

b) Undertaking by the bidder:
   i. The bidder shall submit an undertaking as per clause No. 4.1 from the authorized signatory of bidder having the power of Attorney alongwith the techno-commercial bid stating the bidder meets the mandatory minimum LC requirement and such undertaking shall become a part of the contract.

      In cases of procurement for a value in excess of Rs 10 Crores; the undertaking submitted by the bidder shall be supported by a certificate from Statutory Auditor or Cost Auditor of the company(in the case of companies) or from a practising Cost Accountant or practicing Chartered Accountant (in respect of other than companies) giving the percentage of local content as per clause No. 4.2.

      However, in case of foreign bidder, certificate from the Statutory Auditor or Cost Auditor of their own office or subsidiary in India giving the percentage of local content is also acceptable. In case, office or subsidiary in India does not exist or Indian office/ subsidiary is not required to appoint Statutory Auditor or Cost auditor, certificate from practicing Cost Accountant in India or practicing Chartered Accountant in India giving the percentage of local content is also acceptable.

   ii. The Bidder shall submit undertaking alongwith the techno-commercial bid categorically confirming that in the event of an order under PP-LC, they will furnish additional bank guarantee pursuant to clause No. 13.5 below.

37.12.1.2 After Contract Award:

a) The bidder shall submit an undertaking from the authorized signatory of bidder having the power of Attorney alongwith the bid stating the bidder meets the mandatory minimum LC requirement and such undertaking shall become a part of the contract.
   In cases of procurement for a value in excess of Rs 10 Crores, the undertaking submitted by the bidder shall be supported by a certificate from

Statutory Auditor or Cost Auditor of the company (in the case of companies) or from a practicing Cost Accountant or practicing Chartered Accountant (in respect of other than companies) giving the percentage of local content.

However, in case of foreign bidder, certificate from the Statutory Auditor or Cost Auditor of their own office or subsidiary in India giving the percentage of local content is also acceptable. In case, office or subsidiary in India does not exist or Indian office/ subsidiary is not required to appoint Statutory Auditor or Cost auditor, certificate from practicing Cost Accountant in India or practicing Chartered Accountant in India giving the percentage of local content is also acceptable.

b) Bidder must submit Additional Bank Guarantee pursuant to clause No. 13.5 within 30 days of award of contract under PP-LC.

37.12.2 Each supplier shall provide the necessary Local Content documentation to the statutory auditor, which shall review and determine the local content requirements have been met and issue of local content certificate to that effect on behalf of OIL, stating the percentage of local content in the good or service measured. The Auditor shall keep all necessary information obtained from suppliers for measurement of Local Content confidential.

37.12.3 The Local Content certificate shall be submitted along with each invoice raised. However, the % of local content may vary with invoice while maintaining the overall % of local content for the total purchase of the pro-rata local content requirement. In case, it is not satisfied cumulatively in the invoices raised up to that stage, the supplier shall indicate how the local content requirement would be met in the subsequent stages.

37.12.4 Where currency quoted by the bidder is other than Indian Rupee then the bidder claiming benefits under PP-LC shall consider exchange rate prevailing on the date of notice inviting tender (NIT) for the calculation of Local Content.

37.12.5 OIL shall have the authority to audit as well as witness production processes to certify the achievement of the requisite local content.

37.13 **Sanctions**:

37.13.1 OIL shall impose sanction on bidder for not fulfilling LC of goods/services in accordance with the value mentioned in certificate of LC.

37.13.2 The sanctions may be in the form of written warning, financial penalty and blacklisting.

37.13.3 If the bidder does not fulfill his obligation after the expiration of the period specified in such warning. OIL shall initiate action for blacklisting such bidder/ successful bidder.

37.13.4 A bidder who has been awarded the contract after availing Purchase Preference is found to have violated the LC provision, in the execution of the procurement contract of goods and/or services shall be subject to financial penalty over and above the PBG value prescribed in the contract and shall not be more than an amount equal to 10% of the Contract Price.

37.13.5 In pursuance of the clause No.13.4 above, towards fulfillment of conditions pertaining to Local Contents in accordance with the value mentioned in the certificate of LC, the bidder shall have to submit additional Bank Guarantee (format attached at Enclosure B) equivalent to the amount of PBG.

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