



APPENDIX D

Scope of work Of Contract

Downhole & Surface Well Testing Equipment and Services

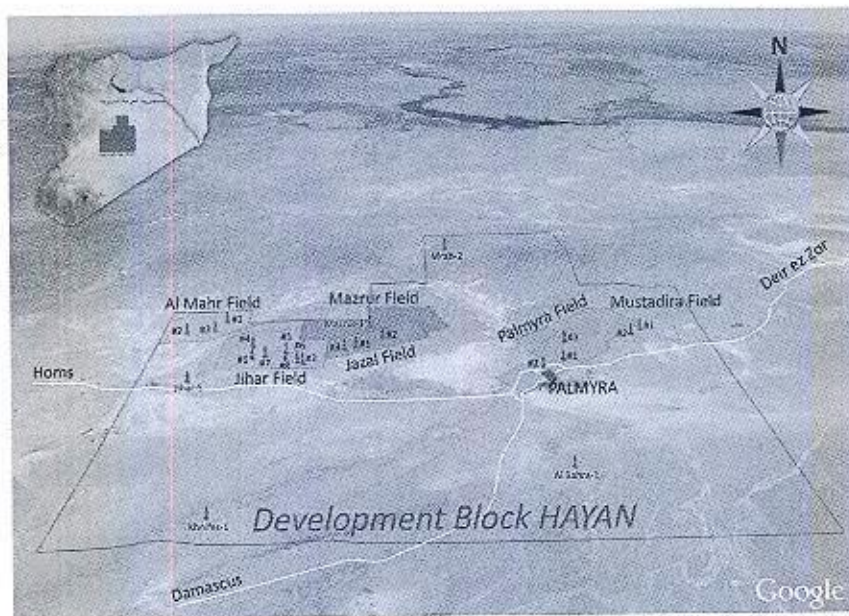
[Signature]
Rabab
18.2.26

WELL LOGGING Services (Call out basis)

SCOPE OF WORK

1 INTRODUCTION:

Hayan Block is located in southern Palmyrides in the central part of Syria near Homs-Palmyra road. It's about 45km from Palmyra town and about 125 km from Homs. It is consisted of 6 fields (Mazrur, Jazal, Al-Mahr, Jihar, Palmyra and Mustadira), and the operation area for this tender will be the Hayan Block including 6 fields. If operation area includes other fields (out of Hayan Block), this will require previous approval of both parties.



2 LITHOLOGY OF RESERVOIRS:

The reservoirs formations belong to (Middle Triassic, Lower Triassic), which consists predominately of various carbonate types, dolomite and limestone, evaporates, shale, siltstone and sandstone

3 TYPES OF HYDROCARBON:

- Gas reservoirs content Gas – Condensate – Water
- Oil reservoirs content Oil – associated gas – water.

J. K. K. K.
J. K. K. K.

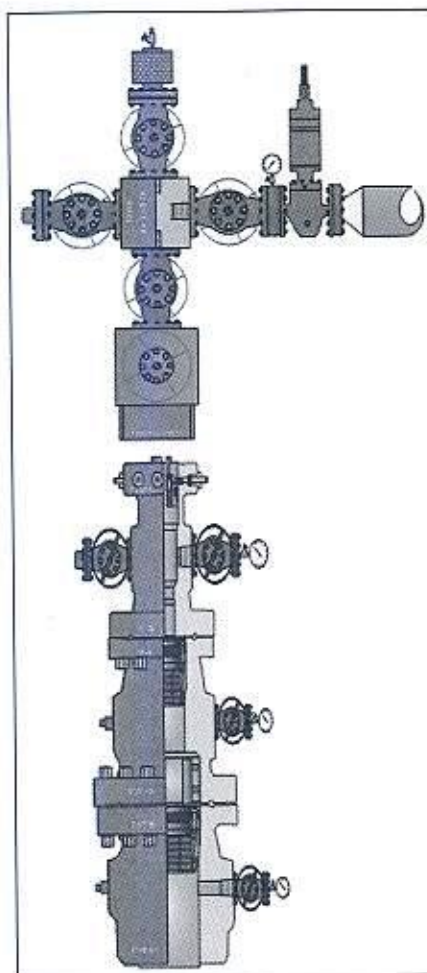
J. K. K. K.
J. K. K. K.

4 COMPANY EQUIPMENT DESCRIPTION:

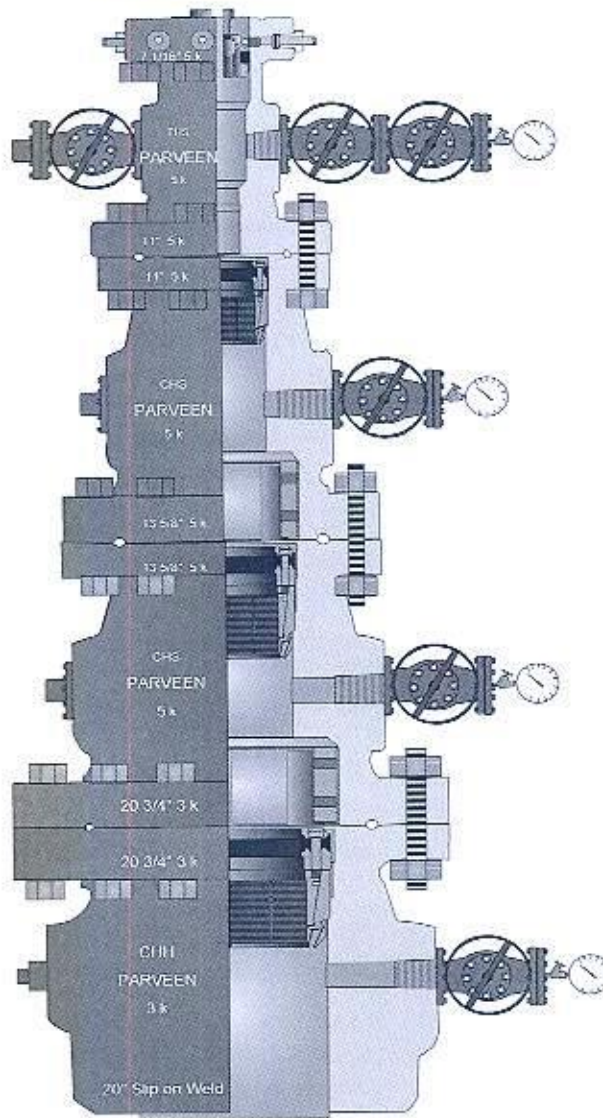
4.1 X-TREE TEMPLATES:

4.1.1 VOLGA NEFTMASH

X-mass tree	
Make	Russian
Size	2 5/8"
Rating	5000 psi
Description	adapter 7 1/16" X 2 5/8" 5000 russian, LMV +UMV 2 5/8" X5000 russian, russian cross, 2 5/8" swab valve x5000 tree cap flange x5000, Russian, 2 5/8" KWV x5000 russian with nipple flange, 2 5/8" 2 WV x5000 + instrument flange 2 5/8" X5000
Bonnet	adapter 7 1/16" X 2 5/8" 5000 Russian
Make	Russian
Top Flange	2 5/8" x 5000
Bottom Flange	7 1/16" x 5000
Hanger	no
Tubing Head Spool	tubing spool 11" X 7 1/16" with 3 valves 5000
Make	Russian
Top Flange	7 1/16" x 5000 psi
Bottom Flange	11" x 5000 psi
Hanger	
Casing Head Spool	casing spool 13 5/8" x 11" x5000 with 1 valve 2 5/8" 5000 Russian
Make	Russian
Top Flange	11" x 5000 psi
Bottom Flange	13 5/8" x 5000 Psi
Hanger	
Casing Head Housing	casing head housing 13 5/8" with 1 valve 2 5/8" 5000 russian



4.1.2 PARVEEN X-TREE



Tubing Head Spool

Code	
Serial No.	
Make	Parveen
Top Flange	7 1/16" 5 K
Btm Flange	11" 5 K
Hanger:	
Height:	24 7/16"

Casing Head Spool

Code	
Serial No.	
Make	Parveen
Top Flange	11" 5 K
Btm Flange	13 5/8" 5 K
Hanger:	
Height:	24 3/4"

Casing Head Spool

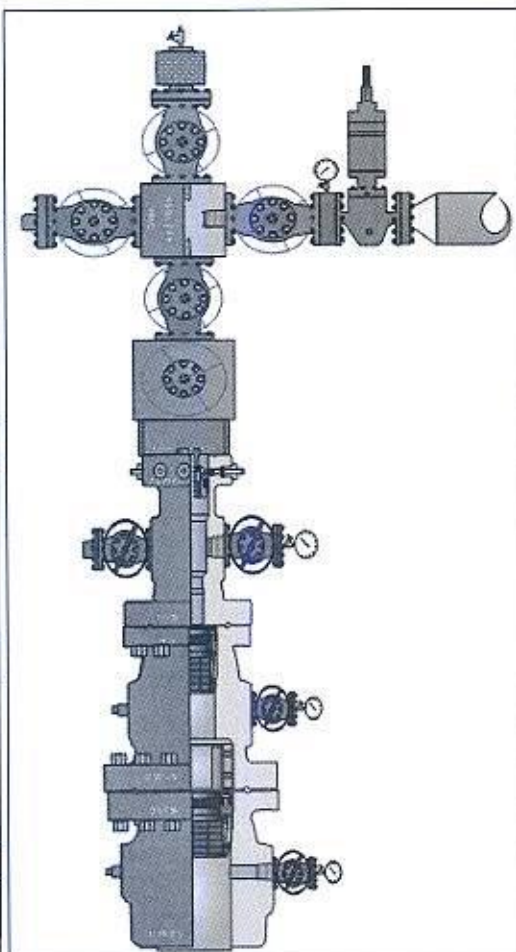
Code	
Serial No.	
Make	Parveen
Top Flange	13 5/8" 5 K
Btm Flange	20 3/4" 3K
Hanger:	
Height:	24 1/2"

Casing Head Housing

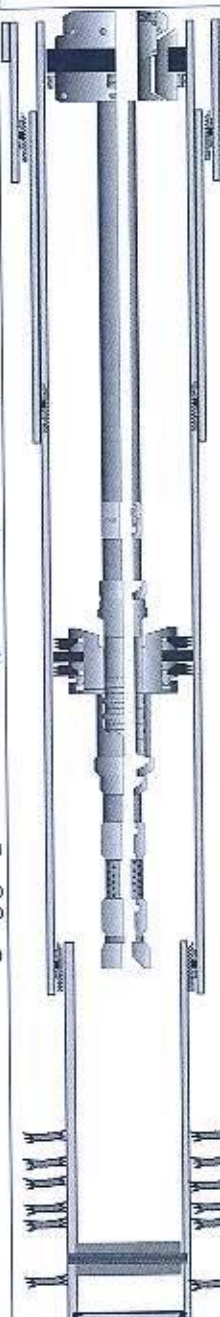
Code	
Serial No.	
Make	Parveen
Top Flange	20 3/4" 3K
Btm Flange	20" Slip On Weld
Hanger:	
Height:	21 3/4"

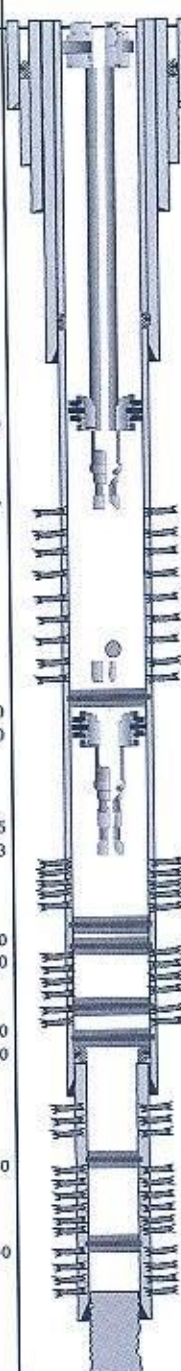
4.1.3 BREDA X-TREE

X-mass tree	
Make	Breda
Size	3 1/8"
Rating	5000 psi
Description	block adapter 7 1/16" x 3 1/8" 5000 breda with LMV, 3 1/8" U/MV x 5000 Breda, Cross Breda, 3 1/8" SV X 5000 + tree cap flange Breda, 3 1/8" KVV x 5000 with WECCO.
Bonnet	
Make	Breda
Top Flange	3 1/8" x 5000 psi
Bottom Flange	7 1/16" x 5000 psi
Hanger	Breda 1000 psi
Tubing Head Spool	
Make	tubing spool 11" x 7 1/16" with 2 valves 5000, adapter 11" 10000 X 11" 5000 Breda
Top Flange	7 1/16" x 5000 psi
Bottom Flange	11" x 5000 psi
Hanger	
Casing Head Spool	
Make	Breda
Top Flange	11" x 10000 psi
Bottom Flange	13 5/8" x 10000 Psi
Hanger	
Casing Head Spool	
Make	Breda
Top Flange	13 5/8" x 10000 psi
Bottom Connection	21 1/4" x 5000 Psi
Casing Head Housing	
Top Flange	21 1/4" x 5000 Psi
Bottom Flange	20" Slip on weld
Hanger	



4.2 TYPICAL WELL SCHEMATICS:

Drilled by: RIG: National 601		MZR-2		Recompleted by :	
Completed by: National 601				Compl. Sup. :	
Original DF-GL : 7.60 m		Max inclination 4 Deg. @ 1712 mBDF		HUD: 3532.68 mBDF	
Original DF-THS: 7.17 m					
Casings & Perforations:	THS	BDF		Completion Assy's:	Min I.D.
ALL DEPTH ACCORDING TO TUBING TALLY 20" 85# K-55 BTC @ 281 to 0.0 mBDF TOC @ surface	0.00	7.17		Tbg Hanger Parveen 7 1/16" x 3 1/2" 5000 psi	2.922"
13 3/8" 72# - N-80 - BTC to 1094.2 mBDF 13 3/8" 65# - K-55 - BTC to 1502.97 mBDF 13 3/8" 72# - N-80 - BTC to 2717 mBDF TTOC @ Surface					
9 5/8" Liner: 2651.49 - 3008 mBDF 9 5/8" 47# - L-80 GT to 2691.84 mBDF 9 5/8" 53.5# TN-110 HC to 3008 mBDF TOL @ 2651.49 mBDF					
	2936.83	2944.00			
Liner 7": 2942.84 - 3409 mBDF T-Back 7" 29#L-80 GT 0.00/2944 mBDF 7" 32 #TN125HC 2942.84 to 3409 mBDF				Tbg 3 1/2" NSCT 10.2 L-80	2.922"
TOC to 1500 m	3245.81	3252.98		SSD CS(X)-1D 2.75" (SLB)	2.75
	3260.35	3267.52		7x 3 1/2" MRP (29-32), HNBR (SLB)	2.907
	3273.54	3280.71		Landing Nipple "X" 2.75"	2.75
	3273.93	3281.10		perforated joint	2.922
	3283.23	3290.40		Landing Nipple "XN" 2.635"	2.635
	3292.34	3299.51		End Of completion (tubing joint cut into mule shoe	
Liner 5" 3294.6 - 3507 mBDF 18 # L-80; Tenaris 3294.6 - 3393.97 m 18 # L-80 ANJO 3393.97 - 3532.68 m 13 # L-80 TN110HC 3532.68 - 3570 m			TBG VOL TO SSD : 0 m3 Ann. Vol. : -14.19 m3 Ann.Fluid: NaCl +3% KCl 1.06 g/cm3 Last Up-Date :		
Perforation: K.Dolomite D2_2 3432.5 - 3441.5 (9 m) 3458 - 3461 m 3462 - 3465 m 3475 - 3481 m 3505 - 3508 m 3527 - 3530 m					
Retainer plug at 3519 m					
			TD : 3570 mBDF		

JHR-2 Well					
Original DF-THS: 7.62 m		Max inclination 8.37 Deg. @ 3455 mBDF		HUD: 3027.9 mBDF	
Casings & Perforations:	THS	BDF		Completion Assy's:	Min I.D.
ALL DEPTH ACCORDING TO TUBING TALLY	0.00	7.60		Tbg hanger BREDA 10 K	74.5
20" K-55 #133 BTC Casing Shoe @ 481 m					
16" N-80 #84 BTC Liner Liner top @ 227 m Shoe @ 1763 m				Tubing 3 1/2" Gost	74.21
13 3/8" N-80 #68 BTC Casing Shoe @ 2731 m					
9 5/8" L-80 # 47 Casing Shoe @ 2905 m					
7" L-80 #29 VAGT production Liner L.top @ 2772 m tied back to surface Shoe @ 3436.3 m					
5" Q-125# 18 production Liner Liner top @ 3400 m Shoe @ 4016 m	2896.30	2903.90		Permanent Production Packer (chinese packer)	
	2901.57	2909.17		WEG	
	3020.30	3027.90		RPP3-148	
	3021.90	3029.50		7" x 4" Ultra pack Permanent Pkr	101.6
	3026.85	3034.45		WOR Nipple, 2.562"	65
	3030.03	3037.63		3 1/2" WEG	74.2
	3230.40	3238.00		K1 plug @ 3238 m, TOC @ 3187 m	
	3242.40	3250.00		K1 plug @ 3250 m	
	3339.90	3347.50		K1 plug @ 3347.5 m	
	3388.90	3396.50		K1 plug @ 3396.5 m	
	3491.60	3499.20		K1 plug @ 3499.2 m	
	3664.40	3672.00		K1 plug @ 3672 m, TOC @ 3667.6 m	2.892 6.184
				TD : 4168 mBDF, TOC @ 3900 m	

5 SPECIAL TERMS AND CONDITIONS:

Contractor shall provide complete Well Logging services for vertical or deviated wells. The services required are cased-hole logging. All logging requirement specified are estimated and are subject to change prior to or during operations and at Company's sole option depending on events while performing the service or job.

- 5.1 The well logging services as described below shall be performed on a call out basis. However, Company reserves the right to change job requirements.
 - 5.2 Company may, from time to time, require specific services other than listed in Scope of Work, which are normally offered by the Contractor and included in the Contractor's Standard Price List (Bidder has to submit a Standard Price List in his financial offer but it will not be obligated to company).
 - 5.3 The Contractor shall provide suitable equipment, tools, instruments, materials, sources and all supplies to perform specified services or other services required by Company.
 - 5.4 CONTRACTOR will provide accommodation for CONTRACTOR personnel.
 - 5.5 CONTRACTOR will provide food and water for CONTRACTOR personnel.
 - 5.6 CONTRACTOR will provide fuel, diesel or lubricants for service and for CONTRACTOR vehicles all times during the contract.
 - 5.7 COMPANY will provide Security protection for CONTRACTOR personnel in well work site at no cost.
 - 5.8 CONTRACTOR shall be responsible for insurance for its equipments, tools, vehicles, personnel ... etc.
 - 5.9 Contractor shall provide first aid and other emergency medical aid for CONTRACTOR'S PERSONNEL at the well site to the same extent as furnished by COMPANY'S to its own employees.
 - 5.10 If operations have to be delayed by Company when contractor's equipments are at well location or contractor is performing a service; COMPANY will compensate to CONTRACTOR a standby rate as defined in Appendix E for each calendar delay day till commencing/resuming operations on the well
 - 5.11 The company has the right to cancel or modify any work order by a written notice before commencing the required service.
 - 5.12 **Lost in Hole (LIH) or Damage Beyond Repair (DBR):**
 - 5.12.1 Company will disregard any LIH or DBR list from the contractor.
 - 5.12.2 Contractor must ensure that the tool can work in the well, so any cut in the cable or tool stuck will be the sole contractor's responsibility. In this case, company will not compensate the contractor at all for the LIH tool and will not pay the cost of the job for the contractor.
 - 5.12.3 In case LIH was because of well abnormal conditions, such as kick or borehole instability, and based on a written letter from the contractor, an investigation committee should be established from (HPC, GPC) to determine the real reason of abnormal condition.
 - If the committee decision that LIH was due to abnormal condition and not contractor's negligence, contractor must provide an original **manufacturer** invoice for the lost tool that contain year of production, price and serial number with all required customs declaration to be compensated taking into consideration that depreciation rate of 5% per year will be applied (but not exceed 50% of the price mentioned in the invoice).
 - If the committee decision that LIH was due to contractor's negligence, company will not compensate for the LIH tool and will not pay the cost of the job.
 - The decision of the committee must be final and obligatory for all sides.
 - 5.12.4 COMPANY shall assume the entire responsibility for fishing operations for CONTRACTOR'S or its subcontractors' equipment.
- The cost of fishing operations will be applied as follows:
- If the decision of the investigation committee shows that LIH was due to an abnormal condition and not contractor's negligence, the cost of fishing operation will be the company's responsibility.
 - If the decision of the investigation committee that LIH was due to contractor's negligence, the cost of fishing operation will be the contractor's responsibility.

- During fishing operations, no standby rate will be applied for either company or contractor.
- 5.13 Operating conditions for surface and subsurface equipment are: -10 to +124°C, CO₂ up to 5% and working pressure up to 5,000 PSI.
- 5.14 CONTRACTOR shall furnish Labor and equipment for loading and unloading the CONTRACTOR'S EQUIPMENT, materials and supplies at the well site at no cost.
- 5.15 The COMPANY shall be entitled to designate a COMPANY representative at the well site who shall at all times have access for the purpose of observing tests, inspecting the SERVICES performed by the CONTRACTOR or verifying the record of items furnished by the CONTRACTOR. Such COMPANY REPRESENTATIVE (S) shall be empowered to act for the COMPANY in all matters relating to the CONTRACTOR'S operational performance under the CONTRACT.
- 5.16 CONTRACTOR shall be responsible for data interpretation and preparation of full interpretation report pursuant to required services. Company will reserve the right of Quality Check (QC) during data acquisition and interpretation.

6 REQUIRED SERVICES:

6.1 Flowing Bottom-Hole Pressure (FBHP Log):

This log will be composed of a full list of tools (CONTRACTOR to specify the required tools or set of tools which will be the subject of COMPANY's approval) to determine the following parameters:

- Depth correlation.
- Confirm HUD (Hold Up Depth).
- Dynamic pressure in-between perforated intervals
- Dynamic gradient from surface to the depth of bottom perforated intervals

6.2 Static Bottom Hole Pressure (SBHP Log):

This log will be composed of a full list of tools (CONTRACTOR to specify the required tools or set of tools which will be the subject of COMPANY's approval) to determine the following parameters:

- Depth correlation.
- Confirm HUD (Hold Up Depth).
- Static pressure between all perforated intervals.
- Static gradient from surface to the depth of bottom perforated intervals
- Draw-down and build-up pressure transient analysis
- Determine well deliverability
- Characterize formation damage and other sources of skin effect
- Well drainage radius.

6.3 Production Logging (PLT Log):

This log will be composed of a full list of tools (CONTRACTOR to specify the required tools or set of tools which will be the subject of COMPANY's approval) to determine the following parameters.

- Depth correlation.
- Confirm HUD (Hold Up Depth).
- Pressure and temperature in-between perforated intervals in two modes (Flowing and shut-in well).
- Pressure and temperature from surface to the depth of bottom perforated intervals in two modes (Flowing and shut-in well).
- Drainage radius.
- Type of produced fluid from every zone.
- Productivity index and pressure for every zone.
- Detection of mechanical problems such as leaks behind and inside casings, channeling behind pipe and locating deformations of tubular.
- Estimation of cross flow between zones caused by uneven depletion, and source of unexpected water production.

6.4 Saturation Log (S_w):

This log will be composed of a full list of tools (CONTRACTOR to specify the required tools or set of tools which will be the subject of COMPANY's approval) to determine the following parameters:

- Depth correlation.
- Confirm HUD (Hold Up Depth).
- Fluid saturations of water, oil and gas behind conductive and non- conductive casings
- Determine Water- Oil contact (WOC), Gas- Oil contact (GOC) and Water- Gas contact (WGC).

6.5 Corrosion log:

This log will be composed of a full list of tools (CONTRACTOR to specify the required tools or set of tools which will be the subject of COMPANY's approval) to determine the following parameters:

- Depth correlation.
- Confirm HUD (Hold Up Depth).
- Internal tubing and casing diameters and any diameter change.
- Evaluation of corrosion, erosion, wear, bending, buckling, pits, holes and other defects with high accuracy.
- Measure the buildup of scale, paraffin or other mineral deposits in the wellbore.

6.6 Other (Optional):

Bidder is requested to propose other tools and services which he may find useful and quote the price in his standard price list (It will not be obligated to company).

7 EQUIPMENT SPECIFICATION:

The logging unit, tools and maintenance items necessary to perform the abovementioned services shall have the following minimum requirement:

7.1. TRUCK Unit**7.1.1. GENERAL REQUIREMENT**

- The Contractor shall be responsible for provision of Unit Service Package on call out basis.
- The Unit contains PCE suitable for at least 5000 psi working pressure.
- The Contractor shall provide competent service technicians for running, tool servicing and testing , field reporting and any other service required to ensure an efficient operation.
- The Contractor shall provide technical support to the Company in job planning and design and to provide post job reporting.
- Contractor shall provide documents including but not limited to equipment certification, inventory reports, tool string diagrams, rig-up drawings, operating procedures, post job reports and problem analysis.
- The bidder shall submit all technical manuals, drawings, job safety assessment (JSA), standard operating procedures etc for all the offered equipment along with the bid.
- The Contractor shall ensure that QA/QC procedures are followed and that all the requirements of API5CT, API14A and other API Specifications and Standard as appropriate are complied with.

7.2. Pressure/Temperature Survey:**7.2.1. Gamma Ray**

Max Outer diameter	2 in. (50.8 mm)
Measuring range	0 -1,500 API units
Accuracy	± 5%
Stability	Within accuracy specification in full temp. range

7.2.2. Casing Collar locator

Max Outer diameter	2 in. (50.8 mm)
materials	corrosion resistance throughout

7.2.3. Pressure/ Temperature Gauges

Max Outer diameter	2 in. (50.8 mm)
Pressure	
Max total/combined error	0.02% FS
Resolution	< 0.01 psi
Temperature	
Accuracy	0.15° C
Resolution	< 0.005° C

7.3. Production log tool (PLT)

Measurement	sensor technology	Resolution
Max Outer diameter		2 in. (50.8 mm)
Pressure	Quartz Pressure Gauge	< 0.01 psi
Temperature	platinum resistance	< 0.005° C
Correlation	Gamma Ray	1.1 counts/API
	Collar locator	1 in.
water hold-up	capacitance	0.1%
Fluid density	radioactivity absorption	0.01 g/cc
	inertial response	0.01 g/cc
Flow meter	Full bore & inline spinner	10 pulse/revolution

7.4. Neutron Log

Max Outer diameter	2 in. (50.8 mm)
SSN (Short Spaced Counts)	
Measuring range	0 – 1,500 CPS
Investigation depth	100 – 200 mm (or more than 200)
vertical resolution	100 mm or more
Accuracy	± 5%
Stability	± 5%
LSN (Long Spaced Counts)	
Measuring range	0 – 1,500 CPS
Investigation depth	200 – 300 mm (or more than 300)
vertical resolution	100 mm or more
Accuracy	± 5%
Stability	± 5%

7.5. Flowing behind tubing/casing:

The tool should provide the following data:

- Leak detection (tubing/casing/packer leak)
- Location of open perforations
- Identification of flow zones behind tubing/casing.
- Identification of channeling behind tubing/casing.

Note: Max Outer diameter 2 in. (50.8 mm)

7.6. Corrosion detection

The tool should provide the following data:

- Internal tubing and casing diameters and any diameter change.
- Evaluation of corrosion, erosion, wear, bending, buckling, pits, holes and other defects with high accuracy.
- Measure the buildup of scale, paraffin or other mineral deposits in the wellbore

Note: Max Outer diameter 2 in. (50.8 mm)

8 PROPOSAL REQUIREMENT

Contractor is required to submit equipment technical specification in the following format:

- 1) Service Unit including tool box:

- The Contractor shall be responsible for provision of service unit package on call out basis.
- The Unit contains PCE suitable for at least 5000 psi working pressure.
- The Contractor shall provide competent service technicians for running tool servicing and testing, field reporting and any other service required to ensure an efficient operation.
- The Contractor shall provide technical support to the Company in job planning and design and to provide post job reporting.
- Contractor shall provide documents including but not limited to equipment certification, inventory reports, tool string diagrams, rig-up drawings, operating procedures, post job reports and problem analysis.
- The bidder shall submit all technical manuals, drawings, job safety assessment (JSA), standard operating procedures etc for all the offered equipment along with the bid.
- The Contractor shall ensure that QA/QC procedures are followed and that all the requirements of API5CT, API14A and other API Specifications and Standard as appropriate are complied with.

Technical Specification

Item	Company Requirement	Bidder Offer
1	Slickline /Cableline Unit: Type: Double drum slickline winch unit Safe for Zone-I or Zone-II operations. Self Powered Electric-Hydraulic Unit or Diesel Unit. Slickline OD (in): 0.108" (API 9A wire) for one drum 0.125" (API 9A wire) for second drum Slickline Length (meter): 6000 m or more on each drum Features: a. Shall have rated working pressure at least 5000 psi and 250 Deg. F temperature. b. Shall be able to display and record the following at all times: (-Time -Tension/Weight -Depth - Line Speed). c. Shall include one re-spooling device, one spare empty spool. d. Shall be capable of using 0.125" wire also. Should be suitable for gas or oil environments & chloride environments.	Bidder to attach Slickline / Cable Unit technical specification Yes or No Indicate Display Type Yes or No Yes or No Yes or No
2	Stuffing Box Type Hydraulic stuffing box, operated from the hydraulic control panel. Sheave Size 16" or more Pressure Rating (psi) 5000 psi or more. Features: a. Shall have soft metal inserts (brass or equivalent) b. Shall have Bottom Blowout Gland.	Bidder to specify Yes or No Yes or No Yes or No
3	Slickline Lubricator Lubricator Bore (in) 2.75" min ID Lubricator Length (ft) 32 ft or more in 8 ft and 4 ft parts (Shall be capable to lubricate in a tool string consisting of 2 bottom hole samples over the Swab valve) Pressure Rating (psi) at least 5000 psi Connection Otis Quick union connection (to fit Surface Test Tree/ Flow Head/X-Mas Tree) Features Shall have at least 5000 psi rated bleed-off port to bleed off any pressure while deploying the tool string. Includes external test sub and associated hoses.	Bidder to attach technical Specification

Item	Company Requirement	Bidder Offer
	fittings and pump	
4	Slickline Blow Out Preventer : - Type Hydraulic Dual RAM BOP Assembly; Bore (in) 2.75" min ID Pressure Rating (psi) at least 5000 psi Connection Otis Quick union connection (to fit Surface Test Tree/ Flow Head/ X-Mas Tree) Ram Types Line Rams, Blind or Shear Rams Features Shall be dressed for actual Slickline OD (0.108") and spare rams for 0.125" slickline. Equipped with equalizing valve and hydraulic cylinders c/w test stump / shipping frame. All types of rams shall be capable of centering without damaging relevant line against side loads. Each ram shall have an external indicator showing ram position at all times. Ram locking system required, in order to be able to manually lock the rams.	Bidder to attach technical Specification
5	Hydraulic Control Panel : Type Remote operated hydraulic control with hydraulic accumulators. Features For control of BOPs, stuffing box etc. along with sufficient hoses. Shall be capable of closing BOP in less than 30 seconds Shall have a built in "injection pump with a reservoir of minimum 200 liters" or "injection pump working with compressed air."	Bidder to attach technical Specification
6	Tool Catcher : Spring catch and hydraulic release design -	Bidder to specify
7	Injection Sub Autoclave injection inlet manifold shall include check valve. -	Bidder to specify
8	Slickline Clamps 0.108" and 0.125" Slickline Fishing Clamp. -	Bidder to specify
9	Basic Tool String Basic tool string must include the following tools: a. Rope Socket for attaching wireline to tool string b. Tungsten Stem or Sinker Bar, 3ft, 5ft and 8ft sections adequate for adding weight to the tool in well bore against the well pressure of 5000 psi and different gravity fluid encountered. c. Slickline Jars or Spang Jars, 30" stroke d. Knuckle joints e. X-Overs for downhole gauges, quick lock etc. f. Any other tools required for successful Slickline job g. Should utilize a quick connect connections for high strength.	Bidder to specify a. Yes or No b. Yes or No c. Specify jars type d. Yes or No e. Yes or No f. Please specify g. Yes or No
10	Other Tools Other tools required are as follows: a. Lead impression blocks, 1.25" to 2.875"	Bidder to specify size and number a.

J. Raben
Jun

[Signature]
 43/16

Item	Company Requirement	Bidder Offer
	b. Gauge cutters, 1.25" to 2.875" c. Blind boxes, 1.25" to 2.875" d. Go-devils e. Wire finders f. Wire grabs g. Over shot h. Sand bailer, 1.25" and 2.125" i. Hydrostatic bailer, 1.25" and 2.125"	b. c. d. e. f. g. h. i.
11	Downhole Pressure Recorder with Gauge Carrier : a. OD (in) 1.25" or less b. Pressure Range (psi) 0-5000 psi c. Pressure Accuracy +/- 0.2 % Full Scale or better. d. Pressure Resolution 0.01 psi or better between 0-5000 psi. e. Should be able to run in with Slickline. f. The Gauge carrier shall be equipped with 2 Nos. of mechanical type pressure recorder with the above mentioned specs. Note: Suitable Adaptor to Slickline to be provided along with the tool.	a. Bidder to specify size b. Yes or no c. Bidder to specify d. Bidder to specify e. Yes or no f. Yes or no
12	Downhole Temperature Recorder with Gauge Carrier a. OD (in) 1.25" or less b. Temperature Range (psi) 0-250 Deg F c. Temperature Accuracy +/- 1 Deg F d. Temperature Resolution 0.1 Deg F or better between 0-250 Deg F e. Temperature Rating 250 Deg F f. Features Should be able to run in with Slickline g. The Gauge carrier shall be equipped with 2 Nos of mechanical type temperature recorder with the above mentioned specs. Note: Suitable Adaptor to Slickline to be provided along with the tool.	a. Bidder to specify size b. Yes or no c. Bidder to specify d. Bidder to specify e. Yes or no f. Yes or no
13	Tools, Spares and Accessories All spares, tools, accessories, consumables etc for operations, repair and maintenance to ensure smooth Slickline operations, Toolbox, lubricator racks etc shall be provided by the Contractor.	Bidder to specify

2) P&T specifications:

Bidder shall provide a schematic of tool string which shall include as a minimum the following tools:

Item	Company Requirement	Bidder Offer
1	Quartz Gauge: a. Max Outer diameter: 2 in. (50.8 mm) Pressure Gauges: a. Max total/combined error: 0.02% FS b. Resolution: 0.008 psi Temperature Gauges: a. Accuracy: 0.15° C c. Resolution: < 0.005° C	

3) PLT specifications

Bidder shall provide a schematic of tool string which shall include as a minimum the following tools:

Item	Company Requirement	Bidder Offer
	General: a. Tools max outer diameter: 2 in. (50.8 mm)	
1	Gauges: a. A quartz pressure gauge with a resolution less than 0.008 psi b. A platinum resistance Temperature gauge with a resolution less than $<0.005^{\circ}\text{C}$	
2	Correlation: Gamma Ray: a. Resolution 1.1 counts/API Casing Collar locator a. Resolution: 1 in.	
3	water hold-up: a. sensor technology: capacitance b. Resolution : 0.1%	
4	Fluid density: a. sensor technology: radioactivity absorption or inertial response b. Resolution: 0.01 g/cc	
5	Flow meter: a. sensor technology: Full bore & inline spinner b. Resolution: 10 pulse/revolution	

4) Neutron specifications:

Bidder shall provide a schematic of tool string which shall include as a minimum the following tools:

Item	Company Requirement	Bidder Offer
1	General: a. Tools max outer diameter: 2 in. (50.8 mm)	
2	SSN (Short Spaced Counts): a. Measuring range: 0 – 1,500 CPS b. Investigation depth: 100 – 200 mm (or more than 200) c. vertical resolution: 100 mm or more d. Accuracy: $\pm 5\%$ e. Stability: $\pm 5\%$	
3	LSN (Long Spaced Counts): a. Measuring range: 0 – 1,500 CPS b. Investigation depth: 200 – 300 mm (or more than 300) c. vertical resolution: 100 mm or more d. Accuracy: $\pm 5\%$ e. Stability: $\pm 5\%$	

5) Additional Tools:

Bidder is encouraged to recommend other tools and services which he may find useful. For each recommended tool or service, bidder shall attach tool/ service technical specification including but not limited to: tool/ service benefits, Max OD, resolution, Accuracy... etc.

a. Flowing behind tubing/casing:

The recommended tool should be able to provide the following data:

- Leak detection (tubing/casing/packer leak)
- Location of open perforations
- Identification of flow zones behind tubing/casing.
- Identification of channeling behind tubing/casing.

Note: Max Outer diameter 2 in. (50.8 mm)

b. Corrosion detection

The recommended tool should be able to provide the following data:

- internal tubing and casing diameters
- Evaluation of corrosion, erosion, wear, bending, buckling, pits, holes and other defects with high accuracy.
- Detecting any diameter change.
- Measure the buildup of scale, paraffin or other mineral deposits in the wellbore

Note:

- Max Outer diameter 2 in. (50.8 mm)
- Accuracy: 0.66 mm
- Resolution: 0.13 mm

9 TRAINING:

- Contractor is obligated to conduct training on the interpretation of the logs listed in the table mentioned in APPENDIX E and related works at well sites.
- Training should be conducted based on a training program set by the HPC Company (The training program will include the number of trainees and the training duration).
- Training program will be set by HPC Company in the first month of contract and the details will be discussed in the kick-off meeting.
- Training must start after 10 % of the contract value is consumed, during 3 months maximum as a grace period after that.
- If the training does not start after 10 % of the contract value is consumed, 10 % of each subsequent invoice will be deducted.
- HPC will release all the deducted amounts to the contractor and stop any further deduction only if:
 - Training is completed after issuing the final training report by a committee formed by HPC Company.
 - Training is conducted during the 3 months grace period mentioned above.